

COMPUTER MAGAZINE OF THE YEAR*

your computer

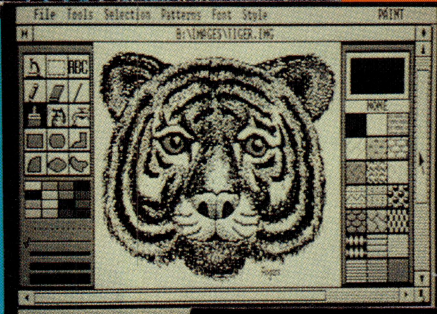
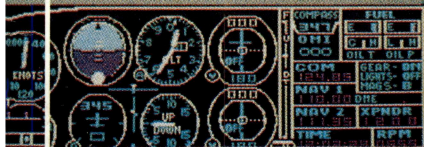
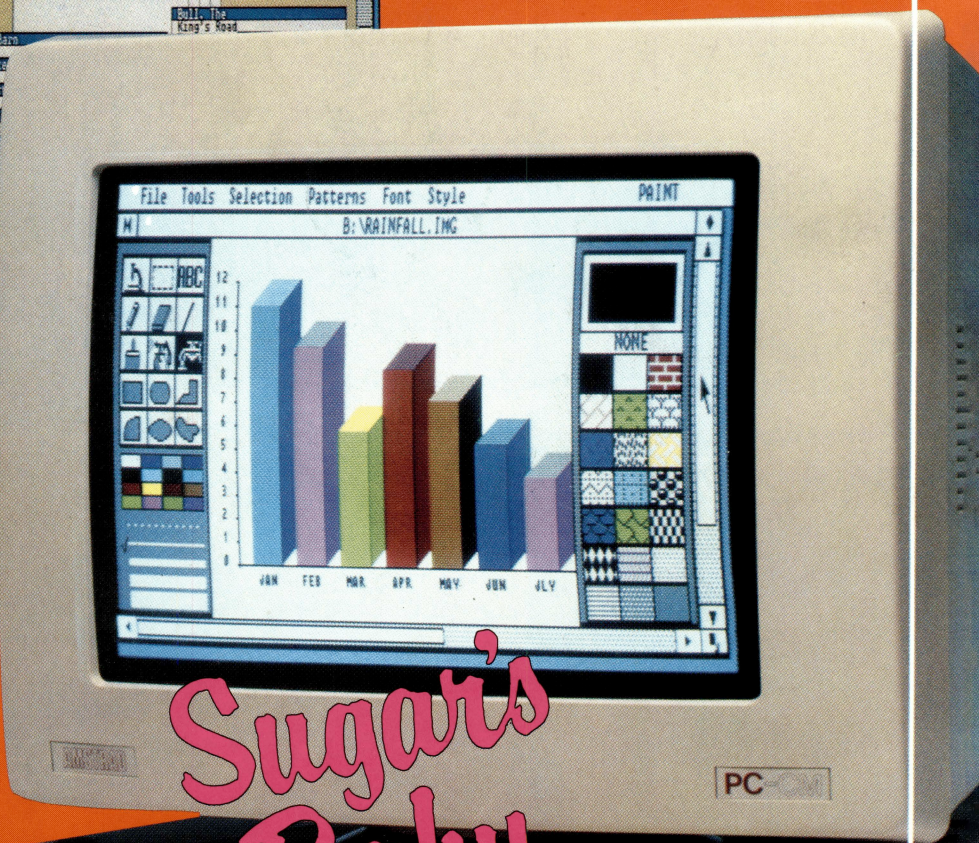
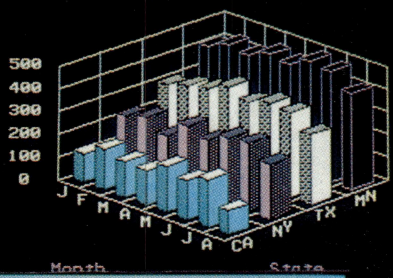
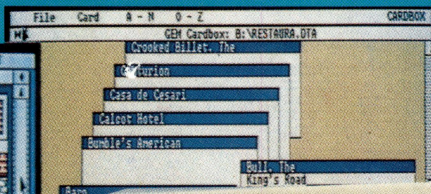
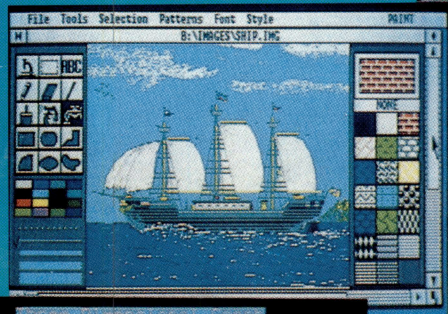
MAKING YOUR MICRO WORK

\$2.95*

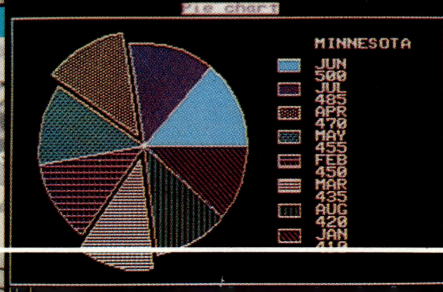
NZ\$3.95 (Incl. GST)

DECEMBER 1986

Christmas Program Present
BONUS
52 page



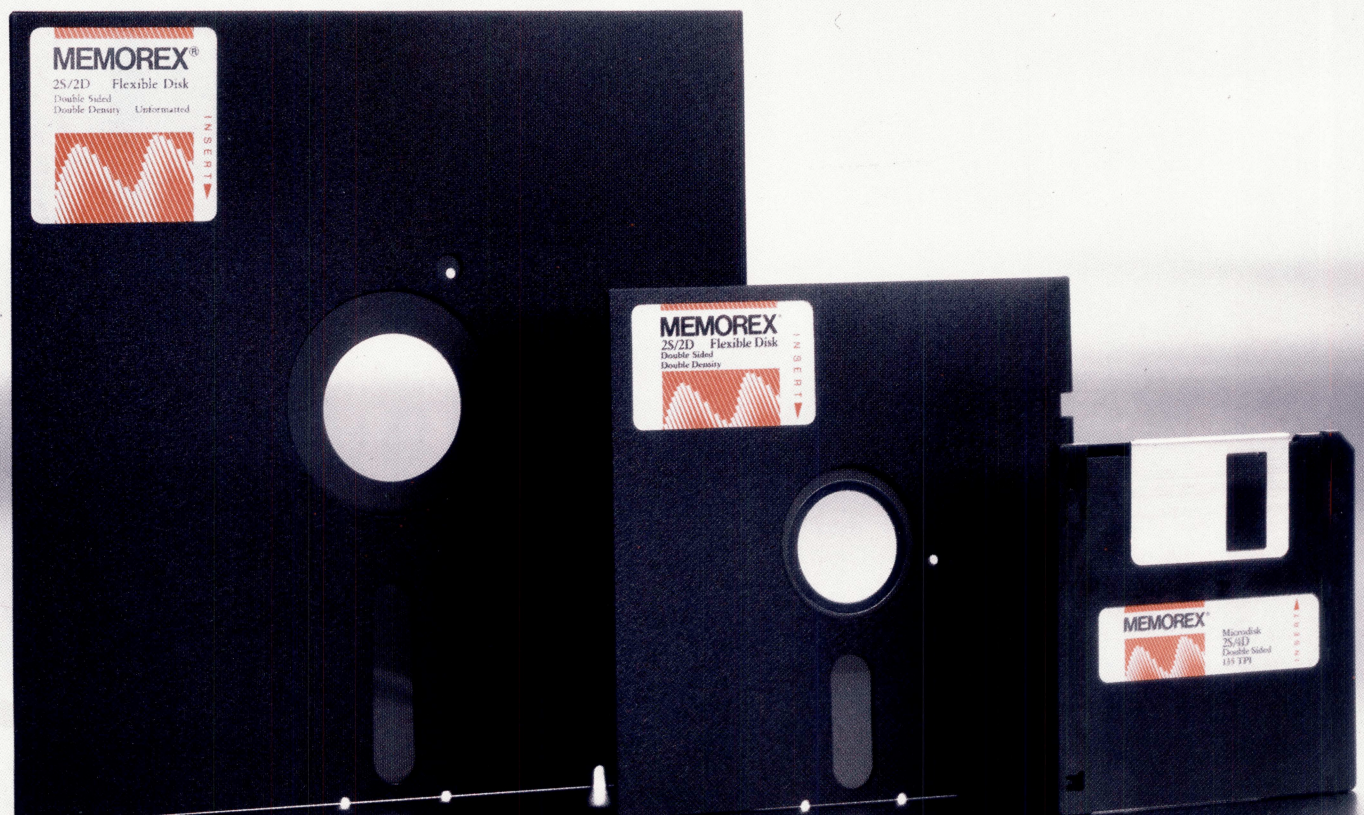
Sugar's
Baby
The Amstrad PC1512
Database Databasics
and still ATtesting



MEMOREX

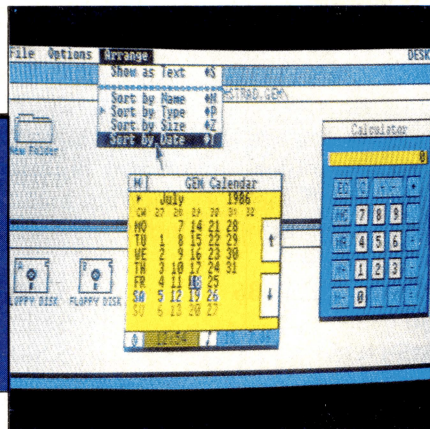
Disks

ADD LUSTRE TO
ANY COMPUTER



For More Information Call Memorex TOLL FREE 008-226117 or Sydney 908-2211 Melbourne 267-2955
New Zealand: Dataset Computer Supplies (N.Z.) Ltd. Auckland 795-561 Wellington 857-686

CONTENTS



NEWS 9

FEATURES 18

Databasics	18
The Les Bell Encyclopaedia of Batch File Programming	28
Debtmaster Part 2	46

REVIEWS 34

Sugar's Baby — The Newly Cloned Amstrad	34
Performing AT Speed	38
Borland Boosts Pascal	60
DOS-Defying Mace	66
A Card Named Hercules	70

INSTRUCTION SET 52

Twenty Turbo Tips Part 1	52
C for Smarties Part 12	78
Byting ProDOS Back Part 2	83

PUBLIC DOMAIN 88

New Products	88
Your C64	98
The Prophet Speaks	101
Your BBC	104
Your IBM	109
Your Mac	110
Services	112
Reader's Classifieds	113

MERRY CHRISTMAS BONUS

52-Page Program Present	Attached
-------------------------	----------

HI-TECH C COMPILER

The HI-TECH C COMPILER is an all Australian high performance C compiler for the Z80 and 8086/8088 processors. Now in use at thousands of sites in Australia and overseas, it combines an excellent user interface and diagnostic messages with smaller, faster generated code than any other compiler. It runs on CP/M-80, PC-DOS, MS-DOS, CP/M-86 and Concurrent CP/M. It allows for the generation of ROM based code and comes with a macro assembler, linker and librarian. The 8086 compiler supports large and small memory models and the 8087 maths co-processor. A cross compiler running under MS-DOS and producing code for the Z80 is also available.

Prices:	8086 Compiler for MS-DOS or CP/M-86	\$300.00
	Z80 Compiler for CP/M-80	\$250.00
	Z80 Cross compiler for MS-DOS	\$300.00

SNAKE

SNAKE is a utility for MS-DOS functionally equivalent to the Unix MAKE command. It automates the recompilation of any modified modules of a programme. This is an indispensable tool for any serious programmer using C or any other compiled language.

Prices:	SNAKE	\$89.00
	SNAKE + BTree + ISAM	\$249.00

BTREE & ISAM

BTree is a b-tree based index and data file manager supplied in C source code form. ISAM is a higher level set of routines providing powerful database management, also in C source form. ISAM requires BTree.

Prices:	BTree	\$119.00
	BTree + ISAM	\$179.00

MACRO ASSEMBLERS

HI-TECH Software has macro assemblers to run under MS-DOS or CP/M for the following micros: 8080, 8085, 8086, 80186, Z80, NSC800, 6800, 6801, 6805, 6809, 6301, 6303 and 64180. All use standard manufacturers mnemonics and come with a powerful linker librarian and object code convertor. The assemblers absolute or relocatable code and Intel and Motorola Hex formats are supported.

Price: \$250.00

A BOOK ON C

"A Book on C" by Al Kelley and Ira Pohl is an indispensable guide for every C programmer, whether a beginner or an experienced professional. An excellent introduction and a comprehensive reference to the C language, it has many examples and working programmes.

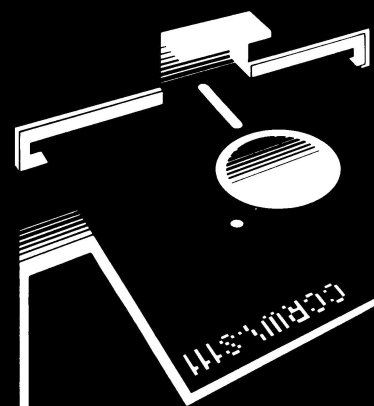
Price: \$34.95

**HI-TECH
SOFTWARE**
The leading edge of Software Technology

P.O. Box 103, ALDERLEY, QLD 4051, Australia.

Phone: (07) 38 6971 International: + 61 7 38 6971

Telex: AA144245 Bulletin Board: (07) 38 6872



MONEY BACK GUARANTEE

All software sold by us has an unconditional 14 day money back guarantee; if you are not satisfied with your purchase you may return it for a full refund.

Of course if you do have any problems or questions we are only too happy to resolve them and will do our utmost to ensure that you have effective, working software.

IMPORTANT NOTE

All software is supplied under licence only.

The terms and conditions are spelt out in our standard licence form, which is included in all documentation, or available on request.

DELIVERY

All orders: \$8.00

* All prices are plus sales tax, currently 20%
Phone your Mastercard, Visa or Bankcard order today or write to:
P.O. Box 103, Alderley,
QLD 4051

ANNOUNCING:
New Products Available Soon
• 68000 Cross compiler running under MS-DOS

AVAILABLE NOW!
• C source code for all assemblers and compilers suitable for any Unix system. Contact us for prices.
• lp - A C library of printer routines: \$139.00 + tax

Editor
Natalie Filatoff
Consulting Editor
Les Bell
Mastermind
Matt Whelan
Production Editor
Jake Kennedy
Managing Editor
Leo Simpson
Art Director
Rolf Hagenmaier
Designer
Kenneth Whipp
Production
Mark Moes
Publisher
Michael Hannan

Contributors

Australia: Brendan Akhurst, Ian Allen, Bill Bolton, Darren Challis, Stewart Flist, Phil Grouse, Tim Hartnell, John Hepworth, Dan Lawrence, Frank Lee, Bruce Mitchell, John Nicholls, Jeff Richards, Ewart Stronach, Dom Swinkels, Colin Tringham.

United States: Howard Karten

Office Services

Carmel Trulcio

Subscription Enquiries

Julie Plummer

Advertising Sales

National Advertising Manager:

Damien Prins

NSW Sales: Craig Rowe

Victorian Sales: Grant Collins

Advertising Production

Danny Hooper

OFFICES

Editorial and NSW Advertising:

180 Bourke Rd, Alexandria 2015.

Tel: (02) 693 6666

Tlx: FEDPUB AA74488

Victoria

150 Lonsdale St, Melbourne 3000.

Tel: (03) 662 1222

Tlx: FEDPUB AA34340

Western Australia

Jim Wells, John Fairfax and Sons,

454 Murray Street, Perth 6000.

Tel: (09) 481 3171

Tlx: FAXWEST AA92635

Queensland

Damien Prins

180 Bourke Rd, Alexandria 2015.

Tel: (02) 693 6666

Tlx: FEDPUB AA74488

South Australia

Dane Hanson, John Fairfax and Sons

101 Waymouth St, Adelaide 5000.

Tel: (08) 212 1212

YOUR COMPUTER

is published monthly by

The Federal Publishing Co Pty Ltd,

Printed by Hannanprint,

140 Bourke Rd, Alexandria 2015.

Distributed Nationally by

The Federal Publishing Co Pty Ltd.

Registered for posting as

Publication No. NBP4384.

See 'Public Domain' section for

information on copyright,

contributions, reader services

and subscriptions.

*Recommended and maximum price

ISSN 0725-3931.

EDITORIAL



Power to the People

IT HAS LONG been a rule chez Bell: no computers at home. 'We don't want the domestic bliss shattered by the whirring of disk drives', is the official reason. But really, after ten years of mucking about with PCs, the simple truth is that I'm fed up with carrying the damn things around. Have been for years.

I sit and watch Matt struggling up the stairs to the office with yet another AT clone, a laser printer or a Mac: I think, 'If computers are such great mind expanders, how come they're doing so much for Wheelie's biceps?'

And so life has been neatly divided, at home and away, for the Bell ménage. In part, the idea of being pursued homewards by computers while spending all day with the beasts has been slightly horrifying. But then, there have been times when I've been pursued by an idea for a C program, or an algorithm of some sort, and the lack of an accessible computer has meant the idea has been lost. But I've always been happy to pay that price; sometimes the rest has done me good.

But the times, they are a changin'. These days, I spend something like 100 nights a year away from home; not just from home, but also from the office. A lot of my time is spent in hotel rooms, where the best form of entertainment is either the tube or a Le Carre novel (and there aren't enough of those, let me tell you!).

So, in an attempt to a) beat the backlog of work accumulating and b) beat the boredom, I finally decided to buy a portable computer which I could take with me on my travels. I haven't been able to do this before, because I'm a power user (in fact, a megalomaniac): I need lots of power to perform even simple tasks. Our main office machine is an 8 MHz 80286 Viasyn/Compupro system (you may have read Jerry Pournelle's comments about these in *Byte*, but he's always had the model before ours) with stacks of memory and cache buffer-

ing and a huge hard disk.

To me, laptop machines have always seemed like toys — floppy-only, limited battery life. The promise was there: of instant access to information, wherever you needed it, whenever you needed it; of total convenience. But none of the machines on the marketplace came near this holy grail.

But today I took delivery of a new machine which breaks this mould forever. The new Toshiba T3100 is a staggeringly useful machine which is truly portable. Laptop, at a push, although it requires mains power. So what? I don't really believe anyone actually works on planes!

So here I sit — at home, for once — writing an editorial. At last, I'm using Framework II seriously, because I know I can use it wherever and whenever I need to, whereas before I had to be near a PC. (By the way, for those who are wondering how to get Framework II working on the Toshiba 3100, which has no up- and down-level keys, they are Ctrl-Shift-Alt — and + on the numeric pad, respectively).

Incidentally, a word on Framework II: this package is now the favourite program of 90 percent of the computer press and certainly of all the serious journalists I know. I personally believe that with the exception of specialised software development in C, dBase, and the like, I could do virtually all my work in Framework II. It's that powerful a package.

Put Framework into a box the size of a T3100, and you have an incredibly general, widely applicable and potent machine. I can take it with me around the world and write articles, prepare budgets, track expenses, figure my flight times and even develop some software on the side. Wherever I am. In the Grand Hotel Krasnopolsky, Amsterdam, or the Portland Intercontinental, London.

Even at home! Oh dear, this may have been a mistake...

Les Bell

FREE SOFTWARE

SPECIAL SELECTIONS FROM THE PUBLIC DOMAIN (02) 29 2866

Well, almost free. We don't charge for the public domain software but there is a small service charge of \$15 per disk to cover promotion costs, selection, testing, copying, etc. Disks are available for CP/M, MS-DOS and APPLE. Mail and telephone order only.

The programmes have been carefully selected, tested and documented. They'll run on a wide variety of computers that accept 5¼" disks. We have tried to choose programmes as machine-independent as possible. However we cannot guarantee the suitability of programmes for your particular machine. Wherever possible we include source-code.

MS-DOS programmes are aimed at the IBM-PC and close compatibles. The NEC APC III will often require the software library extension card to be able to execute these programmes.

Documentation is included on the disks where required — often it is very extensive. Unfortunately, we are unable to provide telephone tutorials on using the programmes.

MS-DOS disks are formatted for standard MS-DOS 2.11 360K. Testing has been carried out for CP/M disks on a Z80 Kaypro II.

About 120 different formats are supported, including Kaypro, Osborne, Tandy, Microbee, Bondwell, Commodore 128, Televideo and Apple II.

MS/DOS

DISK No.

GAMES

M5: SUPER COMPILED GAMES. Eight arcade games for those with colour graphics adaptor. Very absorbing. Includes Pango, Gold, Pyramid, 3-Demon, etc.

M8: SELECTED FAMILY FUN GAMES. A flight simulator, music generator, excellent Pacgirl, space wars, etc.

M11: MONOPOLY. An excellent computer version of this popular board game.

M12: GAMBLING GAMES. One-Armed Bandit, Poker, Blackjack, Roulette.

M13: DUNGEONS & DRAGONS. Cave Quest — a very good adventure game. If you like monsters and magic this is for you.

M14: CREATE YOUR OWN ADVENTURES. An adventure shell that enables you to design your own game.

M15+: TRIVIA COLLECTION. A two-disk set in the trivia quiz tradition. Will amuse you for hours. \$30.

M16: MOVIE DATABASE. Contains details of nearly 2000 movies which are available on videotape. Search by title, rating, cast members, writer, director, etc.

M17: PINBALL GAMES. Contains three fascinating games of varying degrees of difficulty. Engrossing.

M18: SOLUTIONS TO ADVENTURE GAMES. Special collection of hints to solve games such as ZORK I, II, III, Hitchhikers, Starcross, Deadline, Witness, Mask of the Sun, Serpents Star, Dark Crystal, Planetfall, The Enchanters, Death in the Carribean, Infidel, and Seastalker.

M19: NAME THAT TUNE. Designed in the trivia tradition, your computer plays well-known but frustratingly elusive melodies.

UTILITIES

M21: UTILITIES. These are essential and include file maintenance superstars like **SWEEP** and **WASH** as well as library and squeeze/unsqueeze programmes. Lots of them.

M23: UTILITIES. Make life easier for yourself with programmes like Util, Z, Vtype, ST, Protect, Unprotect.

M25: SELECTED UTILITIES. Dozens of highly useful utilities, with documentation, compiled and ready to go. Includes Autodex (super file manager), Membrain (ramdisk) Squeeze and Unsqueeze, Directory Printer, Calendar, File Finder (great for hard-disk), Keyboard Definer, etc.

M26: UTILITIES FOR PERSONAL MANAGEMENT. Similar to side-kick, these are background utilities that provide calculator, notepad/editor, phone index, alarm clock, calendar, printer controls, typewriter-simulator, window access to directory, display/remove/copy/rename files, etc.

M27: UNPROTECTION METHODS. Hints and programmes that help you to back-up a variety of copy-protected programmes. New 3 disk set for \$30 instead of \$45.

M29: DISK LIBRARIAN. A collection of some of the best programmes available for cataloguing your disks and keeping track of files. Provides an alphabetical master list, etc.

M32: DISK DOCTOR COLLECTION. Some of the best debugging and file repair programmes around. Includes Jaz, Easy-Zap, Diskit, etc. OK for hard disks too.

M33: HARD DISK UTILITIES. A special collection of utilities from more than two dozen other disks. For cataloguing, sorting, backing up, changing file attributes, etc.

M34: MULTI-TASKING SHELL. On this disk we have two excellent DOS Shells which allow you to operate and execute from a menu system — Dosmatic and Still River Shell. Interrupt tasks and switch to other programmes. Enjoy a superior work environment.

M35: CP/M EMULATION. Run CP/M software on your PC! Well documented and source coding is provided.

M36: SUPER DISK CATALOGUER. This is a superior capacity disk catalogue that will put order into your files, print listings, locate files, give directory printouts, etc. Ver. 1.3.

WORD PROCESSING

M43: MULTI-FONT WRITER. An incredible word-processing package that prints out scientific notation, Greek letters, gothic, italics, etc. Recommended.

M48: OUTLINER FOR WORD PROCESSING. Considered by many to be the best outliner/ideas processor available. Is fast, can be memory resident, has windows, excellent printing features, etc.

M49: FORM LETTERS. Examples of the most commonly-used business letters — overdue accounts, apologies, credit, layoff, account acceptance, thank you, invitation response, and many more.

M50: PRINTER AND TEXT UTILITIES. Includes memory-resident Note Pad and Cut & Paste, Index System for text files including Wordstar, and Epson Printer Control that sets printer and provides foreign characters.

M51: STYLE ANALYSER. Examines text that you've written and suggests ways that you can improve written expression.

M52+: POWERFUL WORD PROCESSOR. With many features such as split screen, windows, macros, footnotes, indexing, mail-merge, programming language and laserjet drive. Two disk set \$36. NYWord vers 1.2

GRAPHICS

M61: GRAPHICS. A selection of some of the best programmes in the public domain, including an extensive picture-graphics set of commercial standard.

M65: SPRITE GRAPHICS. Lets you create sprite characters from a set of coloured pixels for your programmes. It is self-documenting and contains a sample file. Allows you to display the figure in one step.

M66: EXTENDED FONT CHARACTERS. PC-FONT ver 2.04 is a utility for Epson-compatible printers that will print all of the printable characters of MS-DOS character set — including block graphics, engineering and scientific, foreign language, etc. Control the size, style, density, linespacing, etc. Have solid underline and vertical lines. Gives a more professional output.

M67: COMPUTER-AIDED DESIGN. Powerful control over drawing, graphics, printing and slide show. For easy creation and editing of graphics screens. Two disk set \$30.

M68: GRAPHIC CHARACTER GENERATOR. Create a variety of graphic icons. Also lets you cross-stitch graphics. Contains Icon Master.

LANGUAGES

M85: LANGUAGE — PASCAL. One of the most popular languages for general programming. Well-documented. A very good choice for learning to programme.

M87: SCREEN DESIGNER. An easy to use interactive screen designer to assist you with your programmes. Suits Basic programming.

M91+: TURBO PASCAL LIBRARY — SET 1. Special set of routines, aids and utilities for programming in Turbo Pascal. 7 Disks for \$70 instead of \$105.

M92+: TURBO PASCAL LIBRARY — SET 2. Special set of routines, aids and utilities from Turbo User Group for programming in Turbo Pascal. 6 Disks for \$60 instead of \$90.

M93+: C LANGUAGE LIBRARY. Special set of routines, aids and utilities for programming in C. 6 disks for \$60 instead of \$90.

M94+: ARTIFICIAL INTELLIGENCE. These disks contain TWO Expert System Shells — ESIE and EXPERT. They help you design a system that will gather information and make a recommendation. \$30.

M95+: LANGUAGE — BASIC. This is Snocrest Basic, a two-disk set that contains a real Basic interpreter with manual. Also suits a multi-user system. \$30.

FREE SOFTWARE

SPECIAL SELECTIONS FROM THE PUBLIC DOMAIN (02) 29 2866

M96: LANGUAGE — LOGO. Ladybug provides a popular, turtle-graphics oriented version of this language. Suitable for teaching computer concepts to kids.

COMMUNICATION

M101: COMMUNICATIONS, MODEMS. Two major communication programmes — qmodem and kermit. Lots of bells and whistles.

M103/4: BULLETIN BOARD. A New version (14.1A) of RBBS, a very popular system for those wanting to operate a bulletin board. Well-documented. In compiled Basic with source code. Two disk set \$30.

M107: BULLETIN BOARD LISTING. A comprehensive list of Australian Bulletin Boards. Text files are available in a variety of disk formats.

M108: COMMUNICATION — QMODEM ver 2.0E. A popular programme for modems. Has installation programme. For communicating with bulletin boards. An update.

M109: COMMUNICATION — KERMIT ver 2.28. An updated version of this well-known programme for communication with bulletin boards and other computers. Has source code.

M110: FIDO COMMUNICATIONS NETWORK. This is a famous Bulletin Board System that links up with other bulletin boards.

BUSINESS/ACCOUNTING

M121: GENERAL LEDGER ACCOUNTING. A small-business recording system. Highly regarded. Excellent reports.

M124: STOCK MARKET ANALYSIS. Special aids to help you "think and grow rich". For managing and evaluating portfolios and prospects.

M125: PROJECT/TIME MANAGEMENT. Improving organisation and goal accomplishment. Arranges information, prompts for action.

M126: STATISTICAL ANALYSIS: EPISTAT V3. More than two dozen related basic programmes for analysis-including Chi square, linear regression, Fisher, Binomial, Analysis of Variance, Histogram, Poisson, Correlation, etc.

M128+: INTEGRATED SPREADSHEET. A two disk set of a comprehensive spreadsheet programme. Has Basic and compiled versions with documentation. \$30 for 2 disks. Includes integrated word processor/spreadsheet/database/graphics.

M129: 1-2-3 UTILITIES. Highly regarded collection of utilities that enhance the operations of Lotus 1-2-3.

M132+: 1-2-3 WORKSHEETS. Comprehensive special set of worksheet, aids and utilities for lotus 1-2-3. \$80 for 8 disks instead of \$120. (Does not include M129).

M133: BUSINESS EMULATION. Examine alternatives for better results in manufacture, marketing, advertising, sales, finance, purchasing, labour relations, personnel, banking, and financial planning.

M134+: DEBTORS BILLING. A comprehensive system for maintaining debtors' records, issuing notices and analyses, etc. Two disk set \$30.

M135+: FARM MANAGEMENT. A useful collection of decision/analysis tools. Includes computations for gestation and feeding, harvest and storage strategies, firm price analyses, break-even prices and yields, livestock diets, budgeting, loan calculation, and more. 3 disk set \$45.

M136: PROJECT MANAGEMENT. For construction. Will handle 1000 tasks and does critical path analysis, cash flow, bar charts, cost reports, etc, with subcontractors. Menu driven.

M137: STOCK CHARTING. Keeps track of Stock Market movements — highs, lows, volume, moving average, etc. Requires Basic.

M138+: SALESMAN'S FRIEND. Helps you to keep track of prospects, leads and memos. Also has a built-in word processor and sample formats of letters. Two disk set with tutorial: \$36.

M139: PROJECT QUOTATION. Prepare quotations for projects combining materials, parts, labour, profit margins, etc.

DATABASE MANAGEMENT

M142+: DBASE 11/111 APPLICATIONS. Extensive group of Dbase applications, programme extensions and algorithms. Includes cheque programmes, mail management, inventory control, budgeting and accounting, memo maker, phone index, menu drive, typewriter simulation, depreciation, automatic formatting, search for duplicate entries, Spanish lessons, runtime decoder, graphics and other utilities. Set of 5 for \$50 instead of \$75.

M143: FAMILY TREE/GENEALOGY. Extensive programmes in basic for recording, tracing, grouping, printing, etc., family relationships.

M147: DBASE 111 SCREEN/CODE GENERATOR. Greatly reduces the amount of programming you need to do. Much of the coding is generated to include in your own programme.

M149: FORMS AND REPORTS. A forms generator for displaying information contained in data bases. Compatible with PC-File also.

M150+: SUPER NEW DATA BASE MANAGER. File Express suits sales/stocks/mailling/personnel/payroll. Will calculate, print invoices, labels, etc. Compatible with PC-File. Two disk set \$30. Very good documentation.

M151: MAILING LIST MANAGER. Well-documented programmes that allow you to add, edit, sort, and print mailing labels for all members or selected groups.

M152+: RBASE LOOKALIKE. A three disk set of a powerful, sophisticated database management programme (PC-RIM — Relational Information System ver 5). Operates as standalone system in both menu and command modes or will drive application programmes. Has natural language query system. Extensive documentation and help files. \$45.

EDUCATION

M201: EDUCATION. BASIC TUTORIAL. How to programme in Basic. Onscreen demonstration and explanation.

M203: MATHS TUTOR. A Basic programme that suits primary classes. Has six grades of arithmetic training.

M204: PC-TUTORIAL. Learn more about the operation of your computer, the important commands, etc.

M205+: SPELLING AND VOCABULARY. Suits high school+. Contains 7500 words, but not the most common 4000 — the next most commonly used words. Compiled, with Basic source code included. 4 disk set for \$45 instead of \$60.

M206: HISTORY EDUCATION. A Basic educational game that teaches history. An adventure approach that wins/loses gold, has time warps etc. American conditions but questions can be changed.

SHAREWARE REQUIRED FOR INTERNATIONAL DISTRIBUTION

Select Software has offices and extensive marketing facilities in Australia, New Zealand, the U.K. and very soon in the U.S.A. We are looking for quality Australian and New Zealand software for distribution locally and overseas.

We promote directly to the end user so your product is brought to the attention of hundreds of thousands of potential users, as well as being described in our catalogue.

You retain copyright and we collect on your behalf contributions made by satisfied users. If you wish we can also release your enhanced versions and updates to those becoming registered users.

Naturally we require your permission to copy and distribute your programmes and to charge our normal service fee. Submissions should be original and designed to run on the IBM PC and compatibles. Adequate documentation is required on the disk.

A number of software authors who have been successful with shareware are earning hundreds of thousands of dollars each year — whilst striking a blow for low cost software!

This is your chance to break into the International market at no cost to you. Submissions should be sent to our Chief Executive at the address below.

APPLE II, CPM, MACINTOSH COMMODORE 64

Call or write for free catalogue.

PUBLIC DOMAIN NEWSLETTER

For news, reviews, views and how to use public domain software subscribe to our bi-monthly newsletter and keep informed on the free programmes that help your computer to serve you. Only \$15 per annum. Includes updates to catalogue.

ORDERS

Each disk costs \$15 (Macintosh \$20). Add 20% Sales Tax to cost for disks plus \$3 postage and packaging to your total order. Orders must be prepaid.

*The Public Domain Newsletter costs \$15 per annum and is issued bi-monthly.

PAYMENT BY MAIL TO:
Box C343 Clarence St, PO, Sydney NSW 2000.

TELEPHONE ORDERS:
Pay by Bankcard, Mastercard or Visa.
(02) 29 2866, (02) 29 3810.

OFFICE:
3 Barrack St., Sydney, NSW.

PLEASE INDICATE THE DISK FORMAT REQUIRED WITH AN ALTERNATIVE FORMAT IF POSSIBLE.

SELECT SOFTWARE

Mail And Telephone Order Only.

We cannot guarantee the suitability of public domain/user-supported software for users' needs or equipment.



With one of these on your desk, you may not need a computer.

Thinking about a computer for the office? There's one fact that computer sales people generally won't be too keen to admit: most of the time, computers in offices are used for one thing: simple word processing. Typing up letters, memos and reports.

When they're not being used for that, they're most likely to be used as a communications terminal, fetching information from remote databases. Fairly basic information, too. Like how many Japanese yen the Australian dollar is worth today, or when the first plane leaves for Canberra tomorrow.

It tends to be pretty basic stuff, and doing

it with a computer costing thousands of dollars can be expensive overkill. Rather like using the space shuttle to do your weekend shopping.

Now Microbee Systems has the answer: a new desktop tool called the **TeleTerm**. It's a simple, easy to use word processor, combined with the two main kinds of communications terminal (ASCII and Videotex). It comes complete with built-in telephone and automatic dialling data communications modem. And it costs much less than any computer capable of doing the same jobs: only \$990.00 (not including the video monitor or printer of your choice).

Best of all, it's designed and made by Australians, specifically for Australian conditions.

By the way, we'll let you into a little secret: the TeleTerm is really a dedicated computer. But it's so friendly, you'd never guess.

You can try one for yourself at any of our Computer Centres. Or ring us, to arrange a demonstration in your office.

 **microbee**
computer

Sydney: Ryde (02) 886 4444
Waitara (02) 487 2711
Melbourne (03) 817 1371

Canberra (062) 51 5883
Newcastle (049) 61 1090
Gosford (043) 24 2711

Brisbane (07) 394 3688
Adelaide (08) 212 3299
Perth (09) 386 8289

New Zealand: Auckland (09) 88 1138
Prices quoted are subject to change
without notice.

HI-TECH INITIATIVE

THE SOUTH AUSTRALIANS ARE becoming more and more convincing in the high technology arena what with their entrepreneurial spirit and nicely worked out co-operation between, government, industry and education.

October found them busy in Hong Kong where they had mounted a modest trade show with a handful of carefully selected local high tech companies. They were also running a series of seminars on what they had to offer and how to do business with them.

South Australian Development Minister Lyn Arnold was there. He said: "In broadening and upgrading its economic base away from the traditional mainstays of agriculture, motor vehicles, white goods and food processing, South Australia did not give priority to high technology because it was the flavour of the month or because our trading competitors were doing so. We were building on a considerable strength that already existed through our long involvement with the defence industry, particularly in defence research."

He added that from the beginning, South Australia had never set about buying itself high tech industry. It had never offered big subsidies or relocation payments to lure companies to set up operations in Adelaide.

"Furthermore, we didn't particularly want the biggest names in technology to locate fabrication plants in our state. We wanted to foster a spirit of entrepreneurship and innovation and to create a climate in which companies would want to invest."

He emphasised that they had never wanted companies that would merely treat Adelaide as a distribution point for overseas technology. They had wanted local companies that would use Adelaide as their base for tackling overseas markets.

Lyn Arnold has a gaggle of ministerial portfolios, including State Development and Technology, Employment and Further Education. This allows him an extraordinary opportunity to co-ordinate research and industrial activities and to ensure that the educational underpinning for future developments is firmly in place.

The line-up at the Hong Kong show included:

Computer Protocol – a consultancy that already has a presence in Malaysia and provides expertise in data communications, networking and distributed computing;

Werner Electronic Products – promoting its controlled evacuation system and DUCT teleconferencing;

Labtam – already well-established in a number of Asian markets particularly with its Plasmascan for multi-element analysis;

Micro Byte Systems – with its so-called "glass typewriter" which allows electronic typewriters to serve as daisy wheel printers for computers, and FRED – a micro-based video training aid for the disabled;

Offering Interact Video and Videotex – either operated by coin or as an information unit with a range of applications; it's ideal for dispensing free tourist information;

Masterpac – demonstrating its sophisticated financial planning software complete with windowing and powerful search functions;

Forensic Science Technology International – whose specialised crime detection systems are becoming well known in police, customs and immigration circles;

Chan Computing Services – whose QikDraw provides architectural and engineering professionals with powerful CAD software in both 2D and 3D versions;

British Aerospace – 30 years in space and defence business in Australia and now busy promoting its Australian designed and made medium density satellite search stations which are aimed at the banking and corporate market;

Construction Software Services – with its integrated programs such as RIPAC for quantity surveyors, CHEOPS for contractors, and ADACS for architects;

Pancom Systems – demonstrating 12 modules of ICIS designed for insurance agents;

Labservice – which is looking for either a joint venture partner or distributor for its power conversion products; and

Transtek Systems – whose ultrasonic cleaners are aimed at the jewellery, optical, dental, medical and other small parts markets.

The general opinion was that the range of products South Australia had taken to Hong Kong was well targeted to suit that market. However it will be some time before the participants are able to gauge the worth in dollar terms of the mission.

Brian Werner, managing director of Werner Electronic Products, summed up the general feeling at the close of the show: "We were looking for quality of interest, not quantity." □

PRICES SLASHED
FOR A LIMITED TIME ONLY
FROM AS LOW AS **\$595**

BUY DIRECT
FROM TELECORP
VOLUME DISCOUNTS
AVAILABLE



14-DAY TRIAL PERIOD WITH
MONEY BACK GUARANTEE.
ALL MAJOR CREDIT CARDS ACCEPTED.

TULPITM INTELLIGENT MODEMTM

PLUG IT IN AND LET IT FUNCTION

It's yours with a TULPI.

One compact modem, that delivers data communication you can count on, at a very competitive price.

You don't have to have a technical degree to own a TULPI. Just plug TULPI in and let it go to work.

TULPI makes communications **easier**, there's no switches, talk to your TULPI and other modems, from your terminal; more **powerful**, TULPI can communicate with millions of modems worldwide.

We've built exciting features into the TULPI, to make it the right vehicle, for you to access resources you need, just plug it in.

Once you buy a TULPI it's yours for life.

Because it's built like a computer, you can follow the upgrade path your needs dictate.

The TULPI that is right for you today will also be right for tomorrow, as thousands of TULPI owners have found out.

With a TULPI, communicating via computer, will be as second nature as making a phone call.

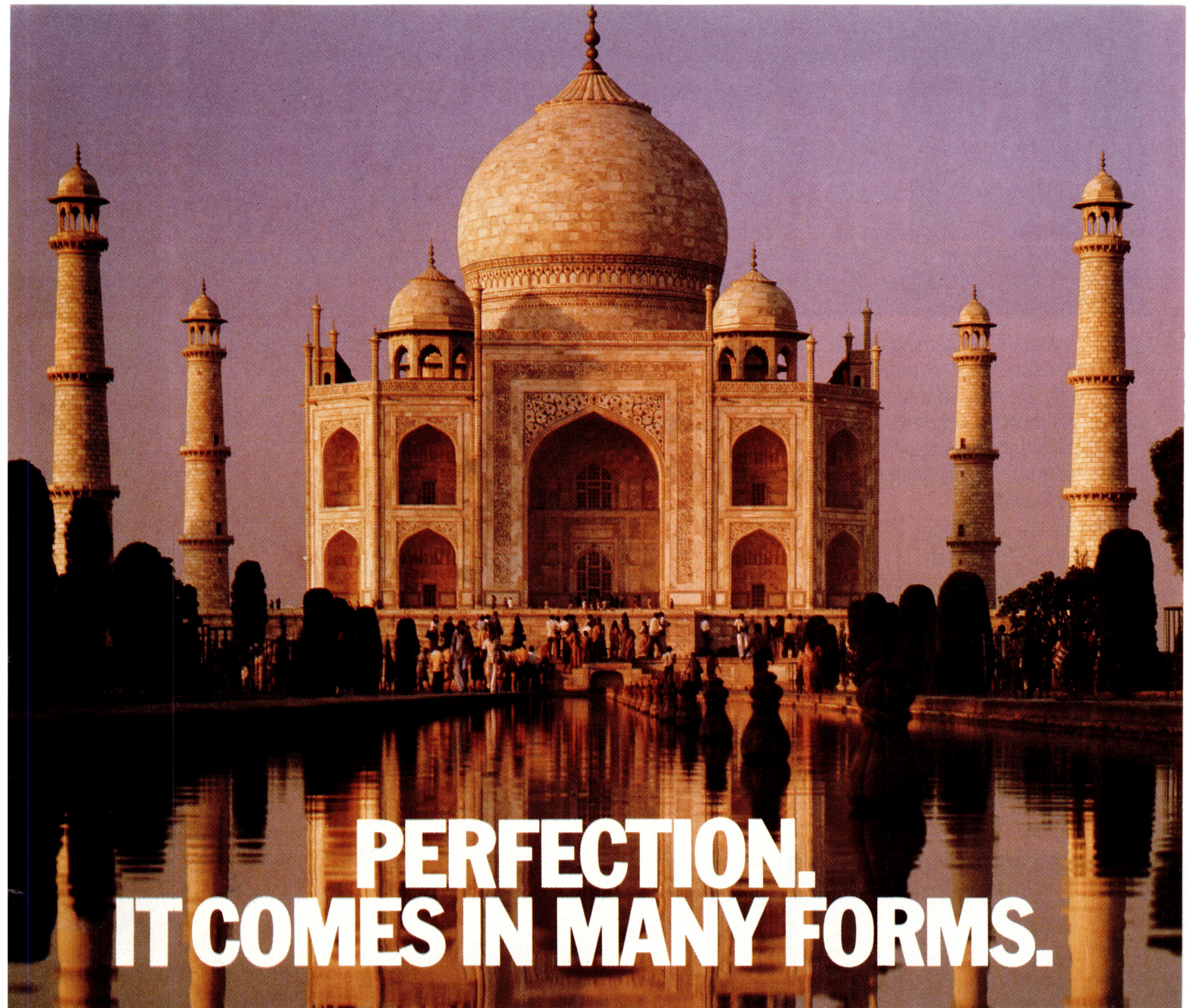
TO BUY YOUR TULPI FROM TELECORP

PHONE: (02) 450 2522

Tele
corpTM

A DIVISION OF
EFTECH LIMITED

26 Tepko Road, Terrey Hills,
NSW 2084, Australia.



PERFECTION. IT COMES IN MANY FORMS.

At Nashua, we believe there should be only one standard in diskette manufacture. Perfection. That's the standard we work to.

Every diskette is manufactured 100% error free, because at each stage of production our diskettes are "statistically control" checked, to make sure the quality is "built in," every step of the way.



Additionally, Nashua guarantees each diskette for life.

That's the kind of quality, consistency and guarantee you have to insist on in today's demanding computer world.

**PERFECTION. THE ONLY
STANDARD WE WORK TO.
PRODUCT OF AUSTRALIA.**



Nashua Discs Direct Sales Centres.

New South Wales: 48 Frenchs Road, Willoughby 2068. Phone: (02) 958 2044. **Australian Capital Territory:** 71 Constitution Avenue, Campbell 2601. Phone: (062) 47 0511. **Victoria:** 523 Victoria Street, Abbotsford 3067. Phone: (03) 428 0501. **Queensland:** 1 Mayneview Street, Milton 4064. Phone: (07) 369 4244. **South Australia:** 31 The Parade, Norwood 5067. Phone: (08) 42 0021. **Western Australia:** 131 Summers Street, East Perth 6000. Phone: (09) 328 1888. **Tasmania:** 209 Murray Street, Hobart 7000. Phone: (002) 23 4377. **Northern Territory:** 8 Gardiner Street, Darwin 5790. Phone: (089) 81 6204. **New Zealand:** Auckland. Phone: 39 2454. **Papua New Guinea:** Phone: 25 6766. **Fiji:** Phone: 2 5195.

THE PC OF THE YEAR, AT THE PRICE OF THE YEAR!

Epson value is something well known in the world of personal computers today.

Not only are they winners of the 1986 PC of the year award but through Lasernetet, their No. 1 Victorian dealer - as the No. 1 value supplier as well.

For instance the following offer has just got to be the special of the year.

- * An Epson dual floppy PC
- * Epson LX-86 printer
- * Choice of green or amber screen
- * Epson MS DOS 2.11
- * FREE software
- * FREE Pack of paper
- * 12 Months warranty

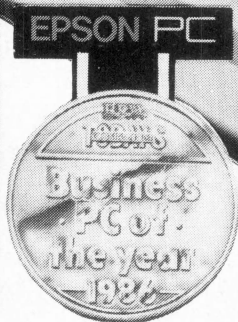
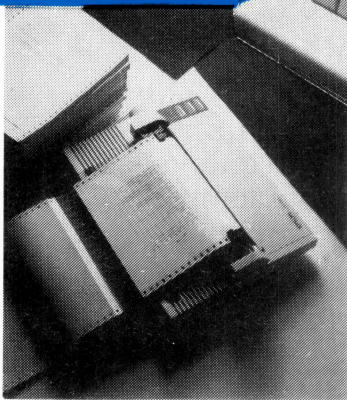
All for just

\$1995

(including tax) While stocks last!

FREE BONUS OFFER

His & Her Seiko gold watch with each system ordered prior to 29/11/86



LASERNET

Computing Systems Pty. Ltd.,
248 St. Kilda Rd., St. Kilda 3182.
Phone: (03) 534 0489 Telex: AA 30625.



*Note: System pictured comes with optional Colour monitor for only \$599.
Lasernet fitted 20Mb. hard disk available for an additional \$990.*

Sextant/144.

(between Alma Rd. & Inkerman St.)

BRIEFLY . . .

■ All is not roses in Europe where the European Community's research program on information technology, Esprit is about to run out of funds. There are 200 projects, with a total budget of approximately US\$730 million, approved under the Esprit program. Responsibility for funding is shared equally by the community and industry.

The EC has called for a second round of support for the program which is seen as Europe's main hope of closing the gap with the US and Japan. But the British Minister of State, Mr Geoffrey Pattie, who chairs the EC Research Council, has challenged the emphasis on integration in the technology projects and has recommended a much more modest approach overall.

The Esprit program has never received the wholehearted support of member nations, especially West Germany and the UK, which both believe it is more important to pull down market barriers than pour public funding into research.

■ That energetic and youthful British enterprise, Amstrad Consumer Electronics, reported a huge surge in its profits for the year. Income leapt from 6.8 million pounds to 29.5 million and the company more than doubled its sales — from 136.1 million pounds to 304.2 million, for the year ending June 30, 1986.

Amstrad wrote off the intellectual property rights of Sinclair Research which it had acquired earlier this year when Sinclair ran into financial trouble. This action resulted in an extraordinary charge on Amstrad of 2.9 million.

Amstrad, which has launched 12 new products in the past year, has benefited from the softness of the world semiconductor market which helped keep costs down just as sales of the company's microcomputers started to accelerate.

However Chairman Alan Sugar is revamping the company's US strategy. Clearly he is not happy with the failure of US distributor Sears World Trade to sell his PCs.

Mr Sugar had anticipated Sears would take 100,000 machines but the distributor shipped only 70,000. He has announced a new US agent to help market his newest models but says Amstrad will handle some of the jobs itself.

Amstrad's latest Australian offering is previewed in this issue — see page 34.

MICA MERGER

Remember Information Electronics, the innovative Canberra terminal manufacturer that once resided in what is now Wang's manufacturing plant in the ACT's Technology Park?

When IE folded, its R and D division provided the nucleus of a new company called Mica Associates which has gone on to make a significant impression on the domestic terminal and intelligent workstation market.

Mica has sold its workstations and networking capabilities to some of Australia's leading organisations, including BHP, the Department of Aviation and Telecom, which has bought 100 Mica Units.

Mica's latest product is the IBM-compatible V400 series.

Mica's technology has now been brought under the Techway marketing umbrella through an arrangement by which Techway acquires Mica and Techway itself is on the receiving end of up to \$2.5 million investment by the Australian Industry Development corporation (AIDC), in return for 15 per cent equity in the company. AIDC already held 43 per cent equity in Mica.

Techway's strength lies in adding value and transforming technology and products into solutions. Mica will bring to Techway its highly regarded line of products and its expertise in communications. It also combines the not inconsiderable skills of industry identities, Dr Peter Jones of Techway and Mica's Tony Rich.

This industrial merger is a nice one. In particular, it ensures the continuing productivity of Mica, one of Australia's most innovative manufacturers, and support of the company in its drive for export dollars. □



Why are more and more major Australian Companies choosing the PURSUIT Series 88 Computer over its competitors?

- a) Reliability?
- b) Performance?
- c) Software Compatibility?
- d) Service & Support?
- e) Availability?
- or f) Price?

All of the above!

PURSUIT
COMPUTER SYSTEMS

Level 7, 608 St. Kilda Road, Melbourne, Vic. 3004
Phone 51 2353 — 51 9885

11683

AUSTRALIAN ACCOUNTING SYSTEM

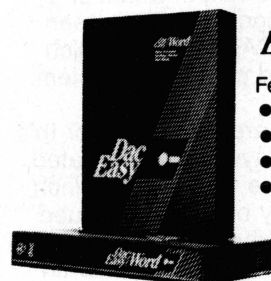
Dac Easy

FULL

- General Ledger
- Accounts Receivable
- Accounts Payable ● Inventory
- Purchase Order ● Billing ● Forecasting

ONLY
\$240

tax
included



Dac Easy Word

Features include:

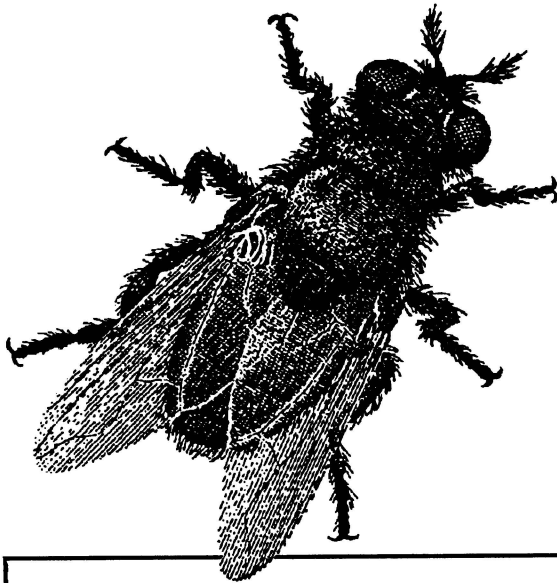
- 4 User Defined Windows
- Cut and Paste, Mailmerge,
- Automatic Hyphenation,
- Automatic Word Search.

\$143 tax
included

To order: Cheque — Bankcard — Mastercard
P & P \$7.50 TNT OVERNIGHT

VIDEO TECHNOLOGY

Mailing Add: P O Box 181
Petersham 2049.
Ph: (02) 569 3700
Fax: (02) 550 0227



**I'd Like To Be
On The Wall
Of Your Advertising
Agent When He Hears
About Your New
PRESIDENT
DESKTOP PUBLISHING
SYSTEM!**

This advertisement would normally be produced by a person, working to a deadline, and with a layout artist, a typesetter and a camera operator. However this advertisement was produced by a person, working to the same deadline, using the PRESIDENT DESKTOP PUBLISHING SYSTEM (PAGEmaster III) in approximately half the normal time and definitely at less than half the cost.

With the PAGEmaster III you don't need to be a creative genius because What You See Is What You Get (WYSI WYG). Your page layout is on the screen in front of you. The PAGEmaster III allows you to move images around the screen, change their size and proportions, set your own type and scale it to fit the space available.

The system will read your PC wordprocessor disks or produce graphics directly onto the screen.

Existing photographs, charts, logos, signatures, letters etc. can, in a matter of 9 seconds, be scanned onto the screen using the Image SCANNER unit which comes as a standard part of the system.

Simplicity and power are the words for this system. Screen displays are manipulated, saved and sent to the 300 dots per inch LASER PRINTER, by commands issued using a MOUSE, keyboard or both. The LASER PRINTER and MOUSE are both standard equipment in
PAGEmaster III.



**SKTOP PUBLISHING ↔ REPORTS —
WSLETTERS → FORMS ↑ MAPS ©
DATA SHEETS || OVERHEAD TRANS-
NUALS | CONTRACTS ← MEMOS ↑
CHARTS ® ADVERTISEMENTS |
NICAL ILLUSTRATIONS ^ DATABASE
LIBRARIES }**

president
EST: 16 YEARS COMPUTERS



(02) 476 2700 (03) 347 0555 (07) 52 3288
(02) 387 7366 (075) 37 4641 (08) 212 1799
(089) 81 5905 (09) 328 6522 (64) (9) 790527 - NZ

AMERICAN GRAFFITI

BY HOWARD A. KARTEN

SOME OBSERVATIONS ON LANGUAGES

IT USED TO BE, in the early days of computers, you had to be something of a linguist to be able to actually use one. The only way to communicate was via the eyeball-twisting numbers of machine language. Even after symbolic assembly language took the fun out of programming, communicating with a computer was still not the world's easiest task.

Millions still cling to the hope that somehow, computers will be made less opaque as a result of 'easier-to-use' or 'user-friendly' languages. One result of this sometimes frail-looking hope is computer users — particularly those in the sub-species *hacker* — keep trying to learn new, or different, languages. And, of course, language developers keep humoring them with newer languages.

All in all, it's not terribly different from those ads appearing in the back of some of the more sensationalist publications: 'increase your IQ', 'lose weight faster', 'increase your bust size'. They always hold out hope that finally, this month, this product, will be the one to do it. So it is with computer languages.

There is a notion that virtuosity is proportional to the number of languages known, a notion which seems deeply ingrained in the human psyche. Learn a foreign language, my father used to admonish me on his more idealistic days, and it will make you a better person later in life. (The old gent never said how, exactly; it was like an article of faith with him.)

Knowing a foreign language has in fact been of limited use. If a snooty waiter in a French restaurant tries to fob off yester-

day's *poisson saute aux pommes frites*, I'm able to deflate him by saying offhandedly, 'No, I think I'll skip the fish and chips today.'

On the other hand, having learned COBOL, Fortran, SNOBOL, PL/I, and a few other programming languages has been of inestimable value to me. Learning two assembler languages on my own, without benefit of formal classes, gave me a lot of confidence in my abilities to educate myself. In the process, I also got some good glimpses into the nature of language and of computers, and I've managed to sharpen my skills generally when it comes to logic, speaking, and organizing work and projects.

In any case, the desire for a better man-machine interface has given rise to a plethora of programming products. Thus, Lotus Development Corp's recently-introduced 'HAL,' the 'human access language' intended to make it easier to use 1-2-3, was widely hailed. Before that, there were speech-recognition, front-end products, promising to provide entre to the computer via the most widespread language of all — spoken English.

But despite the appearance of C, Pascal, ADA, Lisp, Better BASIC, and numerous fourth-generation languages, it somehow seems communicating with a computer is only a bit easier today than it was yesterday.

There always seems to be a tradeoff in overcoming the language barrier. For example, the more elegant and easy to use a language is, the more advance study required to use it. BASIC was created by a Dartmouth college mathematics professor so students would be able to learn a programming language quickly, without excessive study. It is easy to learn; too bad, then, that

programs written in BASIC seem to run slower than those written in many other languages.

All of this seems to point up an interesting law of the physical universe, which I have (somewhat immodestly) dubbed Karten's Law of Conservation of Frustration: frustration can be neither created nor destroyed, but instead, remains constant, changing only its location or its form.

Like everyone else, I have hopes of finding a language that will make it easier for me to deal with my computer. To that end, I've enrolled in a few language courses. I figure Creative Swearing 101 should come in handy in dealing with computer manuals written with English words, but impossible to understand. Euphemisms 2 should be useful when I attempt to wade through the hype of advertisements; and Advanced Legalese should help me understand the few rights actually granted in 'shrinkwrap licenses' and in getting vendors to deliver on those alleged '30 day, money-back guarantees' that so often accompany products today.

My course in Aussie is already paying off; I've learned my first bit of Aussie: G'day, mate.

RUMBLES ON THE ROM FRONT

A recent development by Microsoft has taken CD-ROM (compact disk read-only memory) data storage one step closer to commercial success.

For at least the past two years, observers have been eagerly awaiting, and predicting, the commercial success of optical disk storage. Although optical storage of data has been hailed as an inexpensive way to distribute large databases, it has not yet really caught hold in a big way.

At a September meeting of

SIGCAT, the Special Interest Group on CD-ROM Applications and Technology, Microsoft announced it is working on an extension to MS-DOS 3.x aimed at any CD-ROM disks formatted in the 'High Sierra' file format. This will enable any micro using MS-DOS release 3.1 or 3.2 to access a CD-ROM disk as drive C: or D:. The operating system extensions are expected to be available by the time you read this.

Microsoft expects to license CD-ROM manufacturers to use the software with their drives. Each manufacturer will probably have to make minor modifications to customize the software for the manufacturer's specific product. IBM, following its customary policy, declined to speculate on what course it might follow regarding the Microsoft developments.

In another CD-ROM-related development, Lotus Information Services, a subsidiary of Lotus Development Corporation, announced a CD-ROM system aimed at providing financial data for spreadsheet users in a faster, more easy-to-use (and of course, most costly) manner.

The system, called Lotus Financial, provides weekly updates of financial information on CD-ROM disks, as well as daily updates via another Lotus subsidiary. Among other abilities, the system permits users to load financial data, such as real-time stock prices, into 1-2-3 without exiting 1-2-3 to obtain the data.

PROPRIETARY IBM

A recent agreement between IBM and Intel Corporation which makes the 8086, 80286, and 80386 chips may spell trouble for some IBM-compatible clone manufacturers. IBM has been hinting for some time now that it plans to do something to protect its market share from clones, ▽

which are faster and less expensive than the products bearing the Big Blue Escutcheon.

The agreement calls for sharing of some chip technology and designs between the two firms. One aspect of the technology permits customization of an otherwise standard chip, such as the 80386 superchip now beginning to appear in advanced machines.

What this means is a company like IBM could start with a chip available to all buyers, such as the 80386, and customize it, making it proprietary and therefore more difficult, and certainly more expensive, for clone makers to duplicate the functions of the original item. IBM has already taken this design approach with the IBM PC Convertible and the RT.

IBM just happens to own a slice of Intel.

SHORT BYTES

The July 30 agreement between the US and Japan regarding prices of DRAM (dynamic RAM) and EPROM (erasable programmable ROM) chips is already having an effect on prices of US hardware. The agreement calls for Japanese vendors to sell their 256 Kbyte DRAM and EPROM chips at 'fair market' prices. This has caused the price of the 256 Kbyte chip to rise from around \$US2.50 to more than \$US5.00, and in some cases higher than that. However, since the agreement does not cover finished boards, some board manufacturers have already moved their board manufacturing operations off-shore, to the Far East ...

IBM has begun shipping its PC Convertible with internal modems installed. IBM had said earlier that it expected to start those shipments by the begin-

ning of the fourth quarter of the year; and now expects to fill all current orders before the end of 1986 ...

Speaking of IBM, the company, like many others in the computer industry, is going through some rough times. In September, the company offered early retirement, hoping to reduce its work force by several thousand. In mid-October, the company announced more bad news: third-quarter net income was down 27 percent compared to the third-quarter 1985 ...

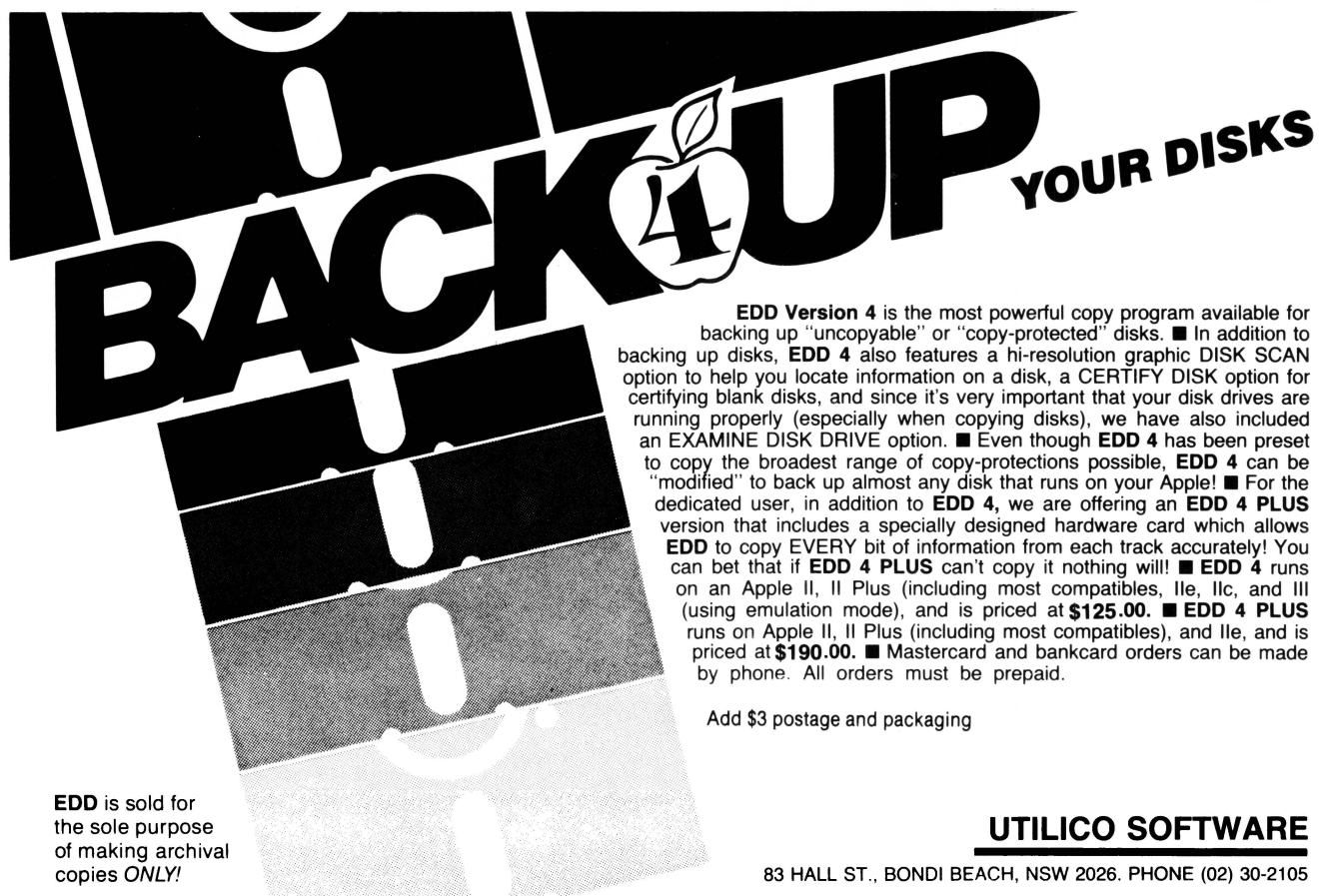
On the other hand, Apple Computer fared particularly well. Earnings for Apple's fourth quarter were up 47 percent compared to the fourth quarter 1985, and for the fiscal year, net earnings more than doubled, from \$US61.2 million in 1985 to \$US154 million in 1986 ...

Apple confirmed widespread

rumour and user experience that upgrade kits for the Apple Laserwriter Plus have experienced high failure rates. The \$US800, 16-chip ROM set adds additional fonts to the Laserwriter's capabilities. Dealers have said the failure rates range anywhere from 25 percent to 60 percent of all kits shipped. Apple has not made any general recalls ...

Printer maker Okidata introduced a six-page-per-minute laser printer based on the Ricoh laser engine. The device costs \$US2195 — about the lowest price for any laser printer yet announced in the US. Only a few years ago, \$2195 bought a moderately fast formed-character printer ...

Want to turn your 80286-based system into an 80386-based one? Computer Classifieds of Miami, Florida, will be selling a \$US500 board that does just that. □



BACKUP 4 YOUR DISKS

EDD Version 4 is the most powerful copy program available for backing up "uncopyable" or "copy-protected" disks. ■ In addition to backing up disks, **EDD 4** also features a hi-resolution graphic DISK SCAN option to help you locate information on a disk, a CERTIFY DISK option for certifying blank disks, and since it's very important that your disk drives are running properly (especially when copying disks), we have also included an EXAMINE DISK DRIVE option. ■ Even though **EDD 4** has been preset to copy the broadest range of copy-protections possible, **EDD 4** can be "modified" to back up almost any disk that runs on your Apple! ■ For the dedicated user, in addition to **EDD 4**, we are offering an **EDD 4 PLUS** version that includes a specially designed hardware card which allows **EDD** to copy EVERY bit of information from each track accurately! You can bet that if **EDD 4 PLUS** can't copy it nothing will! ■ **EDD 4** runs on an Apple II, II Plus (including most compatibles, IIe, IIc, and III (using emulation mode), and is priced at **\$125.00**. ■ **EDD 4 PLUS** runs on Apple II, II Plus (including most compatibles), and IIe, and is priced at **\$190.00**. ■ Mastercard and bankcard orders can be made by phone. All orders must be prepaid.

Add \$3 postage and packaging

UTILICO SOFTWARE
83 HALL ST., BONDI BEACH, NSW 2026. PHONE (02) 30-2105

EDD is sold for the sole purpose of making archival copies ONLY!

ESSENTIAL DATA DUPLICATOR 4

**DUAL SPEED
NOW AVAILABLE!!**

**MADE IN U.S.A.
12 MONTH WARRANTY**

KAYPRO introduces NON-OBSOLESCENCE

NEXT YEAR'S TECHNOLOGY?

That's easy. Replace the existing IBM PC/XT board with an IBM PC AT-compatible board, available now; IBM 32-bit standard, available soon; or whatever the future holds.

MEMORY-HUNGRY SOFTWARE?

Simply exchange the existing multi-function board 768 K standard for any configuration of memory, I/O, and controller boards.

HIGH-RESOLUTION GRAPHICS?

KAYPRO's standard multivideo board features perfect monochrome clarity plus high-resolution color (IBM CGA). But, if it's IBM EGA that you want? — simply snap in a board.

FURTHER SYSTEM EXPANSION?

But of course! The KAYPRO PC is ready for anything. With six available slots, add what you need — networking, modems, more memory — the sky's the limit.

PLENTY OF STANDARD FEATURES?

DUAL SPEED:

Go from 4.77 8MHz with just a flick of a switch

POWER SUPPLY:

A generous 132 watts of power for even the most demanding hard drive.

FLOPPY DISK DRIVES:

Dual IBM-compatible floppy disk drives standard or slide in the drive of your choice.

HARD DRIVE EXPANSION:

Space provided for easy addition of internal hard drives.

BUNDLED SOFTWARE:

A full selection of business software for today and tomorrow.

KEYBOARD:

Detachable, IBM PC AT-style keyboard with security keylock.



Kaypro's new "Snap-In" technology lets you exchange or update all vital system components in seconds.

Computer technology changes with lightning speed. In the time it takes to read this, there will be dozens of new products on the market that make their predecessors obsolete. With that in mind, we'd like to give you a bit of good news. The fully IBM PC/XT compatible KAYPRO PC has been designed to eliminate computer obsolescence. That means it's a snap to update all vital system components — right down to the system's microprocessor.

And, if it's topnotch features you want, look no further. The KAYPRO PC delivers: IBM PC AT-style key-board, two disk drives, dual speed board, built-in color capability, and 768K of standard RAM. The culmination of Kaypro's 33 years of electronics engineering innovation, the American-made KAYPRO PC just may be the last computer you'll ever need.

**PRICE: \$2495 **
\$3295 ** (20 MEG)**

**20 MEG DOES NOT INCLUDE
A COLOUR BOARD **Suggested Retail**

(02) 542 3866

TELEX: AAT76269

For more information or
the location of your
nearest dealer call ...

KAYPRO®
CORPORATION
Innovators of Electronic Products for Over 33 Years



Rose dVines (so known because of her skill with dBase), one of the 'Your Computer' Great Database Searchers of old, has sorted, indexed and compiled her great store of knowledge on the subject into this easy-to-swallow tablet for beginners.

Databasics

Do you crave gently paced interaction with an interpreter; or are you hankering for compiled speed thrills? Do you want to relate? And, if so, are you ready for an entity relationship?

These are some of the questions you need to ask when choosing a database. The database market today offers a bewildering array of products, ranging from simple file managers to artificially intelligent integrated relational database management systems. You can buy a public domain system for the price of the disks themselves, or spend more on the software than you do on your hardware. The choice is yours; but making the *correct* choice requires a great deal of groundwork.

A lot of that groundwork was done in our Great Database Search (various issues of *Your Computer* from September 1984 to January 1986), in which we examined many of the available database systems in detail. However, while Dataflex and KnowledgeMan/2 won out in our estimation, these products are not necessarily the best choice for *you*. Not everyone wants an all-powerful, relational database. For some, that choice would be a waste of time and money. And, like most of the computer world, new products — and new

releases of old favourites — are appearing on the scene all the time. How can you assess these?

Choosing the database which is right for you involves three things: understanding database systems, understanding your own data management needs, and knowing the database market.

Manual and Computerised Databases

A database is basically a filing system: a collection of related information. A library catalogue, the phone book, a personnel filing system are all databases. We work with such manual systems (and their limitations) all the time.

Some disadvantages of traditional manual filing systems are:

Bulk: Such systems can quickly grow to consume large resources in storage space and facilities.

Slow retrieval times: In large systems, finding the required information can be a lengthy process.

Difficulty in manipulating data: Sorting and reordering can be a major project.

Data redundancy: The same information is often stored in more than one place in manual systems; this is a waste of time and resources, and can cause inconsistencies when trying to update information.

Lack of security: Both in terms of restricting access to information, and with regard to safeguarding the information from accidental damage.

Computerised filing systems perform the same functions as manual systems, but, with careful design, they can eliminate the restrictions and problems of manual systems. A well-designed, computerised database lets you manipulate data and produce complex reports with ease, reduces space requirements, eliminates data redundancy, and increases the speed with which information can be retrieved. Many systems also let you design security features and, because it is easy to make back-up copies of data, electronic databases provide insurance against accidents such as fire.

Database Jargon

The software needed to organise a database on a computer system is called a database management system (DBMS), or just a 'database'. Some of the lower-powered systems are called file managers, or list managers.

Three main terms are used when describing information stored in a computer database. A *file* is a collection of related information, such as a list of sales prospects, a membership list or a personnel

file. Different database products may use different terms for a file, such as 'table', 'relation', or 'database' (that term crops up all over the place).

Most database management systems organise files into rows and columns, with each row representing a *record* and each column a *field*. A record is the equivalent of a single card in a card-filing system, or a single entry in the telephone book: it contains all the information relating to one entry in the file. Each record consists of fields (sometimes called 'attributes'). A field is a piece of information describing one aspect of a record.

For example, Table 1 shows a file called SUPPLIER, with each record supplying information about one parts-supply company. The fields in each record are SUPPLIER, STREET and SUBURB.

Indexed Files

One of the delights of computer databases is the ability to quickly order or rearrange information. Most databases provide facilities for sorting information already entered; sorting produces a copy of the original file sorted in a specific order. For example, the SUPPLIER file in Table 1 could be sorted on SUPPLIER to produce an alphabetical listing in supplier order.

Indexing is an alternative to sorting, which usually provides increased retrieval speed and the advantage of not wasting space by producing a copy of the original file. Indexing a database usually produces

The ability to reorder information is one of the big advantages of computerised databases over manual filing systems: imagine the work involved in rearranging a personnel file from alphabetical employee-name order to payroll-number order. On a computerised system, this sort of job can be accomplished in minutes.

an index file. For example, the CONTACTS database could be indexed on LAST-NAME: this would produce an index file containing only the last names of the contacts and a pointer to where the full record is in the database. Because the index contains much less information than the main file and is in a specified order, it is

much quicker to search through it and find the desired record. The CONTACTS file could also be indexed on other fields, such as COMPANY, and then the appropriate index chosen when processing. The field used to create the index is called the *key field*.

This ability to reorder information is one of the big advantages of computerised databases over manual filing systems: imagine the work involved in rearranging a personnel file from alphabetical employee-name order to payroll-number order. On a computerised system, this sort of job can be accomplished in minutes.

List Managers and Relational Databases

There are two main categories of database on the market: list managers and relational databases.

List managers provide facilities for storing and manipulating information in single files, and are suitable for use by non-programmers. They cannot relate information in separate files; for example, you could not directly match records in a file, SALES, containing the fields employee-id, last-name, first-name, department-id, with a file, DEPARTMENT, containing the fields department-id, department-name, and manager. If you were trying to keep track of all this information with a list manager, you would have to place it all in one file; this means you would end up with a lot of repeated information (such as the department manager's name) in each record. Very cumbersome. However, many tasks can be accomplished efficiently using single files, and some of the list managers on the market provide very sophisticated tools for manipulating information. They also tend to be a lot cheaper than the more powerful systems, and easier to use.

The second main category is the relational database managers. These databases are capable of manipulating and 'relating' information in two or more files, enabling complex structures and applications to be developed. This category includes products like dBase, Knowledge-man and Dataflex.

The term 'relational' is applied to a lot of systems with widely different capabilities. It seems many manufacturers use it in the very loose sense mentioned above: that is, the ability to relate information in two files. It does, in fact, have a stricter definition; but essentially, a relational database should enable you to develop

INVENTORY File						
PART#	PARTNAME	QTY	ORDER	SUPPLIER	STREET	SUBURB
A-2321	mudguard	150	20	Jill's Autos	15 Grumble Parade	Camperdown
F-3411	floor mats	200	40	Con's Cars	9/54 Alison Road	Granville
W-9002	needle valve	7	10	Para Parts	321 Parramatta Road	Parramatta
D-0007	cam shaft	18	10	Con's Cars	901 Parramatta Road	Granville
F-6555	brake pads	92	50	Jill's Autos	15 Grumble Parade	Camperdown
H-2639	wheel nuts	390	250	Con's Cars	9/54 Alison Road	Granville
PARTS File						
PART#	PARTNAME	QTY	ORDER	SUPPLIER		
A-2321	mudguard	150	20	Jill's Autos		
F-3411	floor mats	200	40	Con's Cars		
W-9002	needle valve	7	10	Para Parts		
D-0007	cam shaft	18	10	Con's Cars		
F-6555	brake pads	92	50	Jill's Autos		
H-2639	wheel nuts	390	250	Con's Cars		
SUPPLIER File						
SUPPLIER	STREET	SUBURB				
Jill's Autos	15 Grumble Parade	Camperdown				
Para Parts	321 Parramatta Road	Parramatta				
Con's Cars	9/54 Alison Road	Granville				

Table 1. Sample database files — these are just a collection of related information, whether they are called 'tables', 'relations', or 'databases'.

systems in which information from multiple files can be connected, and with no data redundancy (that is, no information stored more than once in a database). The various systems on the market do this to a greater or lesser degree, with some, such as Knowledgeman and Zim, providing superior multi-file capabilities.

Some of the databases on the market don't fit exactly into either category. For example, some of the more powerful databases available are designed around structures other than the relational model; Zim is one such, and it is based on the 'entity-relationship' model. It has similar capabilities to the relational databases, but goes about the job in a different way. Power:Base tries to split the two categories down the middle — offering relational capabilities in a completely structured, menu-driven environment. There are also integrated products on the market incorporating database modules.

Case Study

It's easier to get an understanding of the relative powers of list managers and relational databases by studying an example.

Let's use the INVENTORY file from Table 1. Each record provides the following details about a particular part:

1. Part Number
2. Part Name
3. Quantity on Hand
4. Reorder Level
5. Supplier
6. Supplier's Street
7. Supplier's Suburb/Town

If we use a list manager, this is the simplest way of working — putting all the information into one file. All the information is there at a glance, and with the list manager we can sort and manipulate this information in various ways.

But we've had to enter supplier's details for Jill's Autos and Con's Cars more than once. And, something else has happened ... someone has updated Con's address, but hasn't changed it on all records. This is one of the inherent problems of list managers. While it's easy to notice this in a small file, it's much harder to track when you're dealing with hundreds of records. We could have avoided this by creating two files — PARTS and SUPPLIERS — but there's no easy way to cross-reference the files: we'd have to look up a part in one file, note the supplier, and then look up the supplier in the other.

Relational databases to the rescue! If

As a general rule, the ease with which a database can be used is inversely proportional to the power of the system. Systems which combine ease-of-use with flexibility and power are rare, although all the top contenders in the market aim at this mix, with varying degrees of success.

we use a relational database — one which can handle multiple files — we'll split the information between two files: PARTS and SUPPLIERS. This means supplier information need only be entered once, and we can then use the database's relational commands to create a link between the two files.

For example, if we create the PARTS file with fields one to five from above, and the SUPPLIERS file with fields five to seven, we can then use the multi-file handling capabilities to relate information from one file to the other. With such a set-up, we can search through the PARTS file looking for the desired records, and then *automatically look-up* the supplier's details in the SUPPLIERS file: the Supplier field provides the link and the database manager does the work of noting the supplier and finding it in the second file. Also, any changes we make to the supplier's details need only be recorded once. No data redundancy, and no inconsistencies.

Defining Your Needs

The first thing to do when trying to decide which database to buy, is to define your information needs:

What do you want the system to do? Are you looking for a program to keep a membership list for your organisation; or do you want to build a full-featured inventory tracking system?

How is your current system organised? If your current system is working fairly well, but you need the advantages of speed and

flexibility provided by a computerised system, you may want to be able to convert your present structures onto a computer. Can the database you're looking at accommodate your file structures? Do you have files with a very large number of fields — can the database handle this many?

How much information do you have? How much will it grow? Can the database handle the total volume?

What sort of reports do you require?

What are your likely future requirements? You may buy a database now merely to keep track of a customer list, but in six months time you'll probably be wanting to link this to an inventory file or a monthly sales analysis. Count on your requirements increasing — will the database meet future needs as well as those more immediate?

The more accurately you know your information needs, the easier it will be to evaluate the different databases.

Assessing Your Resources

As well as your needs, you should examine your current resources:

Has anyone in your organization had database experience? With databases in general? Or one in particular? Will you need to train someone from scratch to learn the new system; if so, how easy is the system to learn? Is it worth trying a different system if you already have expertise with another?

How much does the database cost? How much will it cost to use it on a network or to provide multiple copies for employees?

What is your current hardware? If you're using IBM PC/XT/ATs or compatibles, the market is wide open to you. If you have a Macintosh, CP/M-based machine or some more esoteric brand, your choice of databases — especially those with a lot of power and flexibility — is limited. Depending on the importance of the database application/s you wish to develop, and the state of your current applications, it may even be worth changing hardware to be able to select the appropriate database. If you don't have a computer yet, choose your database (and other software) *first* and then see which machines will run it.

Many of the databases on the market won't run unless you have at least 512 Kbytes of main memory and a hard disk. When you buy a program, will you have to upgrade your current hardware to be able to use it? ▶

Databasics

Who is available to convert your current information over to the required format. Apart from development staff, do you have the staff to perform data entry, or will you need to employ someone? Is data entry handled efficiently by the product you're looking at? If you're currently using a database or spreadsheet system but want to upgrade, can the new system automatically convert your existing information to its own format?

How Much Power?

As a general rule, the ease with which a database can be used is inversely proportional to the power of the system. Systems which combine ease-of-use with flexibility and power are rare, although all the top contenders in the market aim at this mix, with varying degrees of success. If you want a program which can create complex applications, you — or someone else in your organisation — are going to have to devote a fair amount of time to learning the system. Count it as part of the expense.

However, with many of the top-line databases it is possible for a novice to learn *the basics* with no more effort than it takes to use a simple list manager. If you want quick solutions to moderately uncomplicated problems, one of the powerful products may be the best investment, as it will offer scope for future development and expansion: just make sure it provides plenty of guidance for the first-time user. For example, dBase III Plus's 'Assistant' and program generator give newcomers an easy route to producing useful data management structures and routines. On the other hand, a program such as Qpro-4 would scare the pants off a novice.

If you only want to convert your card files to their electronic equivalent, don't go buying a fully fledged database management system; it'll do the job for you, but you'll be wasting your money. A list manager is fine for such work.

The relational and multi-file database systems form the section of the market where the real power play happens. If you need a system which is powerful, comprehensive and flexible, one of these systems will most likely fit the bill.

Assessing a System's Power

Some questions for assessing the power of a system include:

Is it a list manager or multi-file database?

Is there an in-built programming language?

Systems with their own programming languages provide scope for developing applications to suit your own needs. Some of these languages are almost as complete as dedicated programming languages such as BASIC, and offer the added advantage of incorporating the database manipulation commands used in the rest of the system.

Does it interface with other languages? Some of the databases have interfaces (or third-party add-ons) which let them incorporate code developed in dedicated programming languages; or which let you develop a complete system in a programming language incorporating the structures and data manipulation commands of the database. The Knowledgeman option, K-C, is such a program, creating a link between Knowledgeman and the programming language C. With such a system, it is possible to develop almost any application you can think of.

Is it compiled or interpreted? Compiled proce-

dures generally run faster than interpreted procedures, although there are other considerations (such as what language the database itself was written in) when checking the speed of a database. There are third-party compilers available for dBase III; they add to the expense, but often add more than just speed.

Is there support for networking and multi-using?

If you're developing an extensive system, network or multi-user support may be important, so more than one person can work on your information at one time.

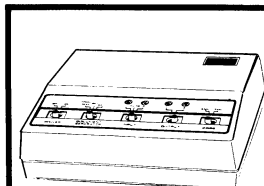
Make sure you see the database in action — preferably in a real-life situation. Some retailers will refer you to current users; if not, check out a local user group if there is one. When you do enter the retailer's lair, have a checklist — such as that in Table 2 — in hand. For simple applications, this may be a little over the top; just make sure you find out what you need to know — not what the salesperson wants to tell you.

Market Rundown: The Leader

Having looked at what databases are, and how to assess them, let's have a brief look around the market.

Ever since the database management system has become a popular tool for microcomputers, one name has dominated the market. That name is dBase, and all other systems on the market use it as the yardstick for measuring their power and their success. dBase originally gained widespread acceptance as dBase II, and has since matured through a number of versions and a major rewrite and upgrade to become dBase III Plus. For a long while, dBase II had no real competitors, and when other powerful database systems started to appear, Ashton-Tate responded with dBase III, a much-improved model of the original program.

Whether dBase is the best database on the market is a matter for dispute, and obviously depends on what you want to do with it. However, being the market leader gives it a number of advantages over other



SAITEK PRINTER SELECTOR

ENABLES 1 OR 2 COMPUTERS WITH PARALLEL OUTPUTS TO AUTOMATICALLY SCAN AND LINK UP WITH 1 OR 2 PRINTERS/PLOTTERS WHICH CAN BE SELECTED BY SOFTWARE CONTROL FROM THE COMPUTER(S). ALTERNATIVELY, PANEL SWITCHES CONTROL INPUT/OUTPUT; LEDS SHOW ACTIVE CHANNELS.

INTRODUCTORY PRICE \$149 TAX PAID

539 PITTWATER RD., BROOKVALE 2100. (02) 93-1383, (02) 908-1718



POSTAGE FOR ORDERS OVER \$75 & UNDER 3kg!!

TOLL FREE
MAIL ORDER NUMBER
008 335757



JUMBO 5 1/4" DISK STORAGE

If you've got lots of disks, you'll appreciate the extra capacity of this disk storage unit when it comes to locating "that" disk!

- Features...**
- 100 disk capacity
 - Smoked plastic cover
 - Lockable (2 keys supplied)
 - 9 Dividers/spacers

Cat. C16027 only \$24.95



5 1/4" DISK STORAGE

Efficient and practical. Protect your disks from being damaged or lost!

- Features...**
- 50 disk capacity
 - Smoked plastic cover
 - Lockable (2 keys supplied)
 - Dividers/spacers

Cat. C16030 only \$19.95



3 1/2" DISK STORAGE UNIT

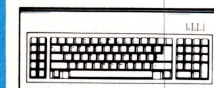
- Holds 10 to 40 x 3 1/2" diskettes.
- Lockable (2 keys supplied)
- High impact plastic lid and base

Cat. C16035 only \$19.95



INTRARGB COLOUR MONITOR!

Size: 14 inch
Sync. Horiz. Scan Freq: 15.75 KHz
Sync. Vert. Scan Freq: 50 Hz
Band width: 18 MHz
Dot Pitch: 31mm
Resolution: 640 x 200 dots
Display Format: 80 x 25 Characters
Display Colours: 16 colours
Input Connector: 9 pin D type
Cat. X14520 only \$695

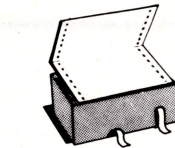


"IBM" AT TYPE KEYBOARD

- 100% IBM PC, XT compatible
- Low profile keyboard design
- Proper placement of shift keys with large key tops to suit professional typists
- 3 step height/angle adjustment
- Cherry brand TS-M00001 19mm low profile switches, meet 30mm ergonomic requirement and provides high performance and maximum reliability
- Curl lead plugs straight into PC/XT
- 3 Status displays

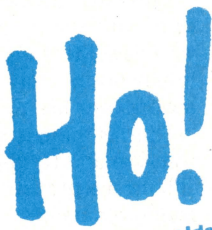
Just like the "Real McCoy" only at a fraction of the price!
Cat. X12020 only \$149

NEW!
105 KEY AT TYPE KEYBOARDS!
Cat. X12022 only \$249



COMPUTER PAPER

Quality paper at a low price! 2,500 sheets of 11 x 9 1/2", 60 gsm bond paper.
Cat. C21001 Normally \$44.95
SPECIAL, ONLY \$37.95



PAPER TAMER

- Restores order to the top of your disk or work area
- Made of white plastic coated steel
- Stores up to 900 continuous sheets
- Allows perfect paper feed
- Allows easy examination of print out

..... \$44.95
(Printer and paper not included)



CANON A-40 PRINTER

- Serial Impact Dot Matrix
- 140 C.P.S
- Near Letter Quality Mode
- 1.4K Buffer

Cat. C20040 \$525



2 & 4 WAY RS232 DATA TRANSFER SWITCHES

If you have two or four compatible devices that need to share a third or fifth, then these inexpensive data transfer switches will save you the time and hassle of constantly changing cables and leads around.

- No power required
- Speed and code transparent
- Two/Four position rotary switch on front panel
- Three/Five interface connections on rear panel
- Switch comes standard with female connector

2 WAY Cat. X19120 \$125
4 WAY Cat. X19125 \$145

2 & 4 WAY CENTRONICS DATA TRANSFER SWITCHES

Save time and hassles of constantly changing cables and leads around with these inexpensive data transfer switches. These data switches support the 36 pin centronic interface used by Centronics, Printronics, Data Products, Epson, Star, Micronics, and many other printer manufacturers.

- No power required
- Speed and code transparent
- Two/Four position rotary switch on front panel
- Three/Five interface connections on rear panel
- Switch comes standard with female connector
- Bale locks are standard

2 WAY Cat. X19130 \$125
4 WAY Cat. X19135 \$145



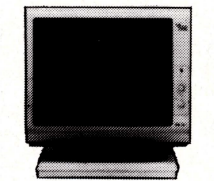
APPLE COMPATIBLE SLIMLINE DISK DRIVES

Japanese Chion mechanism.
Cat. X19901 Normally \$225
NOW \$195



TTL MONITORS

Fantastic resolution! Enjoy a crisp, sharp image with the latest Ritron TTL monitor! IBM compatible, green display, swivel and tilt base.
Green Cat. X14510 Normally \$289
Amber Cat. X14512 Normally \$289
SPECIAL, ONLY \$269



RITRON 2 MONITORS

Stylish, swivel base monitor, available in amber or green.
Green Cat. X14506 Normally \$235
Amber Cat. X14508 Normally \$239
SPECIAL, ONLY \$199



PRINTER LEAD FOR IBM*

- To suit IBM PC XT and clones.
- 25 pin "D" plug on computer end to Centronics 36 pin plug
- Length 2 metres

Cat. P19029 R.R.P. \$44.95
SPECIAL, ONLY \$19.95



RS232 GENDER CHANGERS

- Saves modifying or replacing non-mating RS232 cables.
- All 25 pins wired straight through

Cat. X15650 Male to Male
Cat. X15651 Male to Female
Cat. X19029 Female to Female

Normally \$19.95 each
Our Price \$14.95

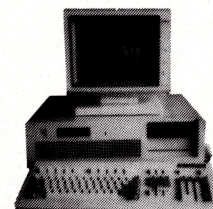


IBM COMPATIBLES

from \$895*

Assembled & Tested in Australia! Incredible deals to suit everyone including special package deals!

- 256K RAM, single drive, graphics, and disk controller cards. \$895
- 256K RAM: Colour Graphics, Disk Controller Card, 1 parallel port, 2 disk drives and 3 months warranty. only \$1,195
- 640K RAM: Colour graphics, Multifunction Card, Disk Controller Card, 2 serial and 1 parallel ports, 2 disk drives and 3 months warranty. only \$1,295



IBM AT COMPATIBLE!

Assembled & Tested in Australia!

- 6 MHz
- 80286 CPU
- 8 slots
- 1 M/Byte main board
- 1.2 M/Byte Floppy disk drive
- 20 M/Byte Hard disk
- Colour graphics display card
- Floppy and Hard disk controller card
- Printer card and RS232
- 200W Power supply
- Keyboard
- Manual

All this for just \$3,995
(Monitor not included)



20 M/BYTE HARD DISK DRIVE FOR IBM* AND COMPATIBLES

Includes hard disk controller card.
Cat. X20010 WAS \$1,250
SPECIAL, ONLY \$995

*IBM is a registered trade mark.



CENTRONICS GENDER CHANGERS

- Female to Female.
- Saves modifying or replacing non-mating Centronics cables.
- All 36 pins wired straight through.

Cat. X15660 Male to Male
Cat. X15661 Male to Female
Cat. X15662 Female to Female

Normally \$33.95
Our Price \$24.95



TELEPHONE ADAPTOR

- Australian plug to U.S. socket
- Length 10cm

Cat. Y16026 \$6.95



TELEPHONE CURL CORD

- U.S. plug to U.S. plug
- Replacement hand set cord
- Length 4.5 metres

Cat. Y16023 \$7.95



IBM COMPATIBLE DISK DRIVES

Tired of paying up to 100% more for Japanese Disk Drives? We now have "direct import" Taiwanese disk drives at much lower prices!

Cat.No.	Description	Price
C11801	500K	\$199
C11803	1 M/Byte	\$239
C11805	1.6 M/Byte	\$259



5 1/4" DISK SPECIALS!

All prices 10 disk boxes!

	1-9	10+
XIDEX S/S/D/D	\$29.95	\$29.95
D/S/D/D	\$38.95	\$36.95
High Density	\$99	\$90

	S/S/D/D	\$27.95	\$26.95
VERBATIM DATALIFE			
D/S/D/D	\$34.95	\$32.95	

3 1/2" DISK SPECIALS!

STOP PRESS! PRICES SLASHED ON 3 1/2" DISKS! SAVE \$10 PER BOX!!

Verbatim S/S	\$54.95
Verbatim D/S	\$59.95
Xidex S/S	\$55.95
Xidex D/S	\$79.95

NEED HIGH DENSITY DISKS FOR YOUR IBM AT?

"Buy your High Density disks at below recommended retail prices from Rod Irving Electronics and SAVE"!!!
R.R.P. \$113 Our Price \$99



TELECOMMUNICATION EXTENSION LEADS

Cat. Y16010	5m	\$12.50
Cat. Y16012	10m	\$14.95



Rod Irving Electronics

48 A Beckett St, MELBOURNE
Phone (03) 663 6151
425 High St, NORTHCOLE
Phone (03) 489 8866

Mail Order and Correspondence:
P.O. Box 620, CLAYTON 3168
Telex: AA 151938



MAIL ORDER HOTLINE (TOLL FREE)

008 335757
LOCAL: 543 7877

POSTAGE RATES:

\$1 - \$9.99	\$2.00
\$10 - \$24.99	\$3.00
\$25 - \$49.99	\$4.00
\$50 - \$99.99	\$5.00
\$100 - \$199	\$7.50
\$200 - \$499	\$10.00
\$500 plus	\$12.50

FREE POSTAGE FOR ORDERS OVER \$75 & UNDER 3KG!!

The above postage rates are for basic postage only. Road Freight, bulky and fragile items will be charged at different rates.
Certified Post for orders over \$100 included free!
Registered Post for orders over \$200 included free!

All sales tax exempt orders and wholesale inquiries to:
RITRONICS WHOLESALE,
56 Renner Rd, Clayton.
Ph. (03) 543 2166 (3 lines)

Errors and omissions excepted

*Apple and IBM are registered trade names



MICRODOT DISKS

100% certified and error free guaranteed!
Where else can you get 100% guaranteed disks at these prices?!

1-9 boxes 10+boxes
5 1/4" S/S (C12440) \$14.95 \$13.95
5 1/4" D/S (C12445) \$17.95 \$16.95

Bulk and dealer inquiries welcome please phone (03) 543 2166



FREE POSTAGE FOR ORDERS OVER \$75 & UNDER 3kg!!

FREE POSTAGE FOR ORDERS OVER \$75 & UNDER 3kg!!

FREE POSTAGE FOR ORDERS OVER \$75 & UNDER 3kg!!

1. Ease-of-use

- clear documentation
- tutorials, either online or in the documentation
- online help

2. Capacity

- is it a list manager, or multi-file system
- maximum file, record and field size
- maximum number of fields and records
- number of files open at once

3. Capabilities

- numeric accuracy
- in-built statistical, string, numeric and financial functions
- date handling; will it support Australian date formats?
- indexing; are multiple indexes supported?
- custom screen designer
- report generator
- programming language
- text handling and search capabilities (important if you need to store and search bibliographic information)

4. Support

- telephone hotline
- upgrades and latest information for registered users
- courses
- newsletters, books
- third-party software
- user groups

5. Security

- built-in password protection
- file encryption

6. Portability

- hardware and operating systems under which it functions (including multi-user and network systems)
- ability to exchange data between other databases, spreadsheets and word processors

7. Requirements

- hard or floppy disks
- minimum and optimum RAM required
- minimum operating system
- other hardware requirements (such as graphics cards)
- other software requirements (is it a complete package, or does it need a host language?)

8. Copy protection

- what sort, if any? and will it run on your hardware?

9. Cost

- single-user
- multi-user and networks
- run-time version
- extras (for example, you may need to add on the cost of training if you choose one of the more complex databases)

Table 1. Sample database files — these are just a collection of related information, whether they are called 'tables,' 'relations,' or 'databases.'

products which may be more powerful, flexible, inexpensive or easier to use.

For a start, support for the product is

abundant: if you can't get what you want from the distributor, third-party support is available in the form of courses, books, consultants, newsletters and user groups. If you come across a problem, it's likely someone else has had the same problem and already found the solution.

Secondly, dBase has had time to mature, with plenty of feedback from users who have identified deficiencies and bugs. It may not be bug-free, but it's been given a work-over like no other on the market.

Thirdly, there is a pile of public-domain software and third-party improvements or enhancements for dBase, including program generators and compilers to increase the speed of both development and operation.

Fourthly, so many people already know how to use dBase that it is possible someone in your organisation is already familiar with it. In that case, you need to decide whether another system offers enough advantages over dBase to make the change-over worth it.

Finally, the latest version — dBase III Plus — is a really excellent product. I can't think of another system which combines power *and* ease of learning and use so well.

The Others

List managers vary markedly in performance and capabilities, ranging from basic to sophisticated. One of the earliest on the scene — pfs:File — provides just the basics; if all you want is an electronic card box, pfs:File will do the trick, and it'll only take you a couple of hours to learn *all* its capabilities. PC-File will give you most of the same capabilities for free — it's a public domain program.

Others in this category offer much more. Reflex provides a whole range of tools for manipulating and extracting the last bit of information from your data; Q&A is part of the 'new wave' of database programs which incorporate elements of artificial intelligence, enabling you to get information out of the system without having to learn special commands and syntax.

Many of the database products available for the Macintosh fall into the list manager category — it's only recently that powerful databases have been appearing for this machine. It's worth noting Ashton-Tate has announced dBase Mac, which should give Mac users most of the powers of dBase III Plus with a few special tricks thrown in.

The three main integrated packages on the market — Symphony, Framework and Open Access — each contain a database module. These packages offer the advantage of combining a variety of functions in one system, with consistent use of commands throughout. They have the disad-

More! Startling software for Mac, IBM PC & Apple!

Hear Ye!! Interface Publications and the Australian Public Domain Library have recently crossed the point to where they have now taken on a vigorous life of their own - and are surging ahead under their own momentum. A growing interest in reasonably-priced and public domain software in Australia, along with a growing recognition that we are offering worthwhile, tested, supported software, has meant that more and more people are coming to us after having had the library recommended by word of mouth, rather than simply responding to advertisements, as was the case in the early days. Thanks for your support to date. We'll continue to search for new software to bring you - at very reasonable prices. We aim for quick turnaround on orders; we support everything we sell, by phone or mail; and we'll try and help you make the most of your computer and software.

Note that the public domain disks we distribute differ from most other public domain disks available in Australia in three very important ways. Instead of just copying disks from other collections, we've put a lot of work into ensuring that (a) the programs on the disks all work; (b) that the tracks on the disk relate to each other (rather than the grab-bag approach of most public domain collections); and (c) that the software represents incredible value. Most public domain disks available from user groups and other distributors contain a mixture of 'gems and junk'. We've separated the gems from a number of disks, and grouped them together into *Australian Public Domain Library* disks of related material, to ensure you get real value for your money. Of course, not all the programs we distribute come from public domain collections. We've also reached exclusive deals with a number of US and UK software companies to distribute their products to you, at cut prices, right here in Australia.

IBM PC

☐ **Assembly Language Tutorial & Routines.** If you want to master assembly language programming on the PC, this is the disk for you (sw \$17, s/tax \$3.40) - \$20.40

☐ **Ledger A** sophisticated, yet easy-to-use, general ledger program, together with an on-disk tutorial as to its use. (sw \$17, s/tax \$3.40) \$20.40

☐ **Set Up Your Own Bulletin Board!** Two-disk set of FIDO, supplied to us by the Compulink User Group in the UK to allow you to set up your own board. (sw \$25, s/tax \$5) \$30

☐ **Hard disk utilities** An extremely worthwhile collection for the hard disk drive user, compiled from over 25 disks in the famous PC-SIG library (sw \$17, s/tax \$3.40) - \$20.40

☐ **Classics Collection-Volume 2.** Two disks of the cream of pd games (some need graphics board). Includes Landmine, Heart, Hostages, Paratrooper, Packgal, Qubert, Flightmare, Jumpjoe, Space Invaders and more! (sw \$25, s/tax \$5) \$30

☐ **The Software Essentials** - An incredibly valuable 4-disk set, together with operating manual, containing all the programs you need for a complete small business or home office. Programs include **PC-WRITE** (word processing), **PC-YEARBOOK** (electronic diary), **PC-FILE** (database), **PORTWORTH** (portfolio management), **PC-DIAL** (communications), **FREECALC** (spreadsheet), complete **ACCOUNTING SYSTEM** (sophisticated, yet easy-to-use program, designed for a small business which can just use a cheque register for its accounting) and more! (sw \$69.95, s/tax \$13.99) \$83.94

☐ **Word Processor Enhancer.** Contains **PC-SPELL** (spelling checker for any ASCII file) plus **PC-OUTLINE** (like Thinklink) to create new ideas, modify and expand them (sw \$17, s/tax \$3.40) \$20.40

☐ **Double Entry Accounting/plus.** **PC-GL** is a double entry accounting program, **PC-AR** is accounts receivable and **PC-STOCK** is a stock evaluation and tracking program. All three on one disk! (sw \$17, s/tax \$3.40) \$20.40

☐ **Fast Typing Course.** Compute better when you type better! (sw \$17, s/tax \$3.40) \$20.40

☐ **Prolog Tutor** Complete with manual, detailed Prolog tutorial, and complete Prolog implementation. (sw \$45.95, s/tax \$9.19) \$55.14

☐ **Expert System Shell.** Create expert systems on any subjects you choose, full instructions, fascinating to run, sample programs on disk include weather prediction and medical diagnosis (sw \$39.95, s/tax \$7.99) \$35.94

☐ **IBM PC Programmer's Toolkit.** Incredibly useful collection of programs and routines, with detailed operating manual, to assist you in developing programs and using your disks. Contains **AUTODEX** to allow you to copy, modify, rename, run and otherwise manipulate your disk contents, **SECTSAVE** to salvage bad sectors, and much, much more! (sw \$39.95, s/tax \$7.99) \$47.94

☐ **Machine Code ELIZA** (sw \$25.95 s/tax \$5.19) \$31.14

☐ **The Signwriter** Create great big signs, on any printer (sw \$24.95, s/tax \$4.99) \$29.94

☐ **Pascal Tutor.** Complete implementation of 'Visible Pascal', printed manual, plus book **PASCAL FOR HUMAN BEINGS**; and **TINY PASCAL** compiler. sw \$45.95 s/tax \$9.19) \$55.14

☐ **PINBALL EXPLOSION** Here's a pinball of fun! Three incredible pinball machine games, plus additional arcade games. Needs graphics card (sw \$17, s/tax \$3.40) \$20.40

☐ **STATISTICAL ENVIRONMENT** This two-disk set, **STATS TOOLS**, statistic package is now available. If you use statistics, this is an essential set of disks. Seven major programs in this set include **PC-PLAN** to generate randomisation plans; **PC-EMS** calculates tables of expected mean squares for balanced experiments and more. (sw \$25, s/tax \$5) \$30

OR SEND FOR OUR CATALOGUE. SEE THE COUPON TO THE RIGHT-->

Macintosh

☐ **Games M-001** Eleven great games including Space Bubbles (like Space Invaders), Backgammon, Reversi/Othello, Asteroids and Missile Command (sw \$25, s/tax \$5) \$30

☐ **Applications M-002** Host of useful applications if you're serious about using your Mac. Includes FEdit 2.02, HyperGrp, Disassembler, Disk Peek, Scan disk, Hex Dump, Painter's Helper, Screen Maker & more (sw \$25, s/tax \$5) \$30

☐ **MacBonanza M-003** An extraordinary range of application and utility programs for serious users. Includes 512K Ramdisk, Quick Print, Banner, Menu Editor, View Paint, Uriah Heap, sleep, print spool, RAMdisplay, magnifying glass, RPN calculator, Dataflow visual parallel programming language and more (sw \$25, s/tax \$5) \$30

☐ **XLisp 1.4 M-004** With printed manual to introduce you to this fascinating experimental object-orientated language. (sw \$25, s/tax \$5) \$30

☐ **Mozart M-005.** Create music with Mozart's musical dice game, and 12-tone strangenesses with Appletones. Both on this disk. (sw \$22, s/tax \$4.40) \$26.40

☐ **Microsoft BASIC programs M-006** A generous selection of programs written in MS BASIC, which you can run even if you don't have MS BASIC. Great chance to learn new programming tricks and techniques. Includes games, cursor editor, statistics, music machine, Mastermind, Pattern Editor and more! (sw \$22, s/tax \$4.40) \$26.40

☐ **McFont #1 M-007.** 346K of brand new fonts for you and your Mac, 25 extraordinary print-stretching possibilities culled from US public domain collections. (sw \$25, s/tax \$5) \$30

☐ **McFont #2 M-008** This disk has 291K more of eye-bending new fonts for you and your Mac; 25 additional new and imaginative fonts to make your documents sparkle. (sw \$25, s/tax \$5) \$30

☐ **Harvard MacKermit 2.2 M-011** The MacKermit communication file transfer system operates by establishing communications between two running programs, one on each computer. With printed manual. (sw \$22, s/tax \$4.40) \$26.40

☐ **Code-Cracker M-014** This allows you to copy many programs which are copy-protected. Make a backup copy of your original software. Complete with instructions as a MacWrite file. Not to be used to break copyright laws! (sw \$22, s/tax \$4.40) \$26.40

Apple II

☐ **Backgammon Plus.** New games disk; also Air Simulator and others (sw \$17, s/tax \$3.40) \$20.40

☐ **Softgraph.** Now you can create pie, bar and line charts from your own data. (sw & printed manual, \$17, s/tax \$3.40) \$20.40

☐ **Art-Fire Organ.** See just how exciting hires graphics can be, suite of programs to produce incredible interweaving, evolving designs; create your own. (sw \$17, s/tax \$3.40) \$20.40

☐ **Advanced Utilities.** 2-disk set for serious programs, includes disassembler, undelete, Applesoft to exec, whole disk copy program, auto line numbering, smuch more (sw \$25, s/tax \$5) \$30.00

☐ **Primary Education Set.** 3-disk set for students up to 11 years old. Wide range of educational programs include maths, word problems. (sw \$32, s/tax \$6.40) \$38.40

☐ **Communication Four.** With these 4 communication disks, your Apple and a modem, you can start your own bulletin board. Complete program, plus many additional comms programs. Note: These use US protocols. (sw \$39, s/tax \$7.80) \$46.80

☐ **Amazing Pinball Machine.** Four hi-speed original pinball games (sw \$17, s/tax \$3.40) \$20.40

☐ **Maths & Stats Companion.** A magnificent collection of vital programs to prepare and manipulate your data, including mean variance standard deviation, chi square test, stats I and II, nth order and polynomial regressions & much more. (sw \$17, s/tax \$3.40) \$20.40

☐ **The Signwriter.** Produce great big advertising signs, greetings, any printer (sw \$24.95, s/tax \$4.99) \$29.94

☐ **The Winning Edge** If you enjoy investing on the horses, but don't enjoy it so much when your investment doesn't pay off, you will probably welcome this program which is designed, as its name suggests, to give you 'the winning edge' when it comes to betting. (sw \$34.95, s/tax \$6.99) \$41.94

Rip this ad out, send us a copy or a note, together with your cheque or credit card (*Bankcard* or *Visa*) details, after adding \$3 to the total of your order for post and packing, and we'll get your software to you. We can also take orders by phone, on 03-772 7566 (be prepared to give your name, address, credit card details and order; if you're unlucky you'll get our nasty answering machine, but it is quite capable of taking the order, so don't hang up!) or by telex on 37970. Note that we're mail order only; we haven't got anything like a shop.

To: Interface Publications (Aust.),
Chelsea House, 34 Camp St.,
Chelsea, Vic., 3196

☐ Please send me the software indicated for my ☐ Mac ☐ Apple ☐ IBM PC

☐ Send me the latest catalogue for my

☐ Mac ☐ Apple ☐ IBM PC

☐ I enclose a cheque for \$_____, or charge my ☐ Visa ☐ Bankcard

Card no.....

Name

Address

Postcode

DESKTOP PUBLISHING: THE BOOK

☐ Now you can have the first completely practical guide to making the most of the opportunities offered by desktop publishing, no matter which computer system you use. Concentrates on ideas to apply right now, with scores of ready-to-copy layout and design ideas. **\$29.95**

Databasics

Product	Multi-file Capability	Programming language	Ease of Learning	Ease of Use	Power	Price
Knowledgeman/2	9	9	4	5	9	\$ 899
dBase III Plus	8	9	7	7	9	\$1095
Dataflex	9	9	4	7	9	\$1400
Meta4	8	none	5	7	8	\$ 120
Sensible Solution	7	7	5	4	7	\$1030
R:Base 5000	9	5	4	4	9	\$1195
Qpro-4	5	9	3	4	8	\$1080
Paradox	8	9	7	8	9	\$1095
Power-base	6	none	7	9	7	\$ 850
Zim	9	9	4	5	9	\$1400
VP-Info	8	7	5	6	8	\$ 150
pfs:File	none	none	9	9	3	\$ 300
PC-File III	none	none	8	8	3	\$ 10
Q & A	none	none	8	9	4	\$ 499
Reflex	none	none	8	8	5	\$ 312
Superfile	none	none	6	4	5	\$ 725

Table 3. Comparison chart — the higher the rating, the better the database is in that category.

vantages of being formidable to learn, and generally being less powerful than the dedicated databases.

The relational and multi-file database systems form the section of the market

where the real power play happens. If you need a system which is powerful, comprehensive and flexible, one of these systems will most likely fit the bill. dBase falls into this category.

Many of these systems have been reviewed in *Your Computer* since September 1984 (see the Index in this year's July issue). If you're looking at relational systems it's worth reading at least some of these reviews to get an idea of what to expect. Since finishing *The Search*, other systems have appeared which are definitely worth checking out: Zim, Power-base, Guru (Knowledgeman/2 with an expert system included — *very* expensive), VP-Info (a dBase lookalike for a fraction of the price), and dBase III Plus.

Table 3 provides a rundown of the major products on the market. It's designed to give you an idea of the range of capabilities and prices. Each category has been scored out of 10.

With a thorough knowledge of how you work now, what you want to do with a computerised database, and your database buyer's checklist in hand, you should be able to find your perfect match. □



Solid Software's LOTTOcheck

19 7 21 15 37

for the Commodore 64 & 128 Computers.

LOTTOCHECK is where the *computer game* meets *serious computing*. Using it is game like, easy and fun for *all* the family but the consequences could be serious - if you call winning lotto serious!

- Developed by database and graphics experts, Lottocheck includes a database of all past GoLotto draws (over 6 years worth! on a free data disk) which are analysed for winning combinations. (You update the database as new draws occur).
- You can select any set of numbers (6-15) and Lottocheck goes through all past draws tallying up **all prizes** in each division, that would have been won with those numbers. For example **try a system 15** and see how it would have performed over the years, **without spending a cent**, apart from the cost of LOTTOCHECK which is less than a single System 10!
- You can select **random** numbers (6-15), which appear on screen as bouncing coloured balls.
- The GRAPH option produces a **histogram** of the frequencies of numbers drawn, up to the present.
- The powerful EVALUATE option lets you **test theories** and predict next weeks draw, using computed rankings of all numbers.
- Other options include list and print together with the usual database functions ADD, INSERT, MODIFY and DELETE which use professional fullscreen, form-like input screens.
- Package includes program and data disks plus extensive **handbook** on Lottocheck, winning strategies, and the maths theory of LOTTO.

NOTE: NSW GOLOTTO Version only, (Tattsлото version is not available to general public). Excellent value at \$49.50, payable by cheque (), money order (), or credit card:

Please charge my Bankcard () Visa card ():

Card NO: _____ Expiry date: _____

Signature: _____ Date: _____

Name: _____ Address: _____



Solid Software,
P.O. Box 218,
Belgrave, Vic. 3160



PURSUIT Series 88



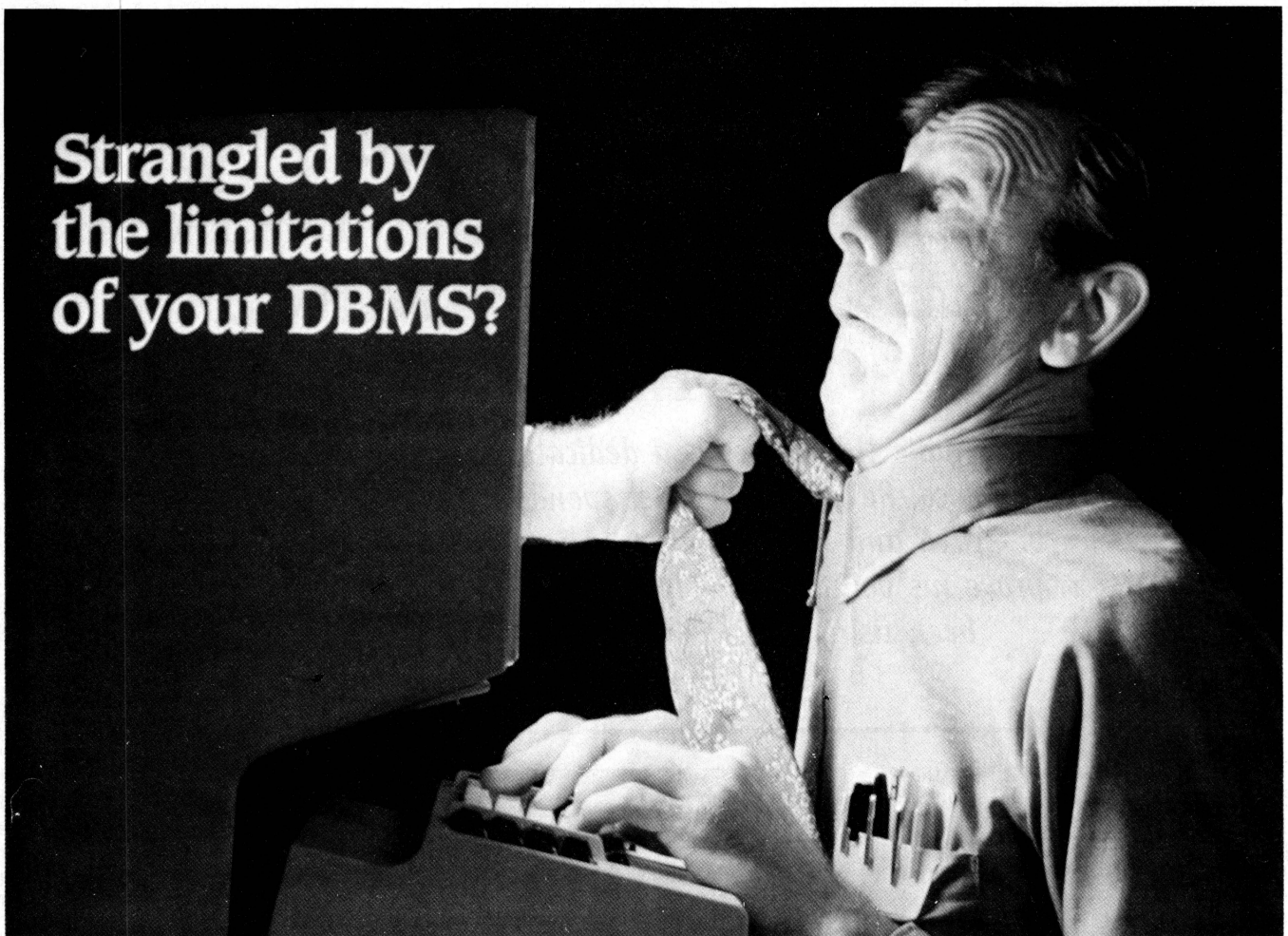
- IBM* Compatible.
- Quality Components.
- High Level of Support.
- 12 Months Parts & Labour Warranty.

*IBM is a Registered Trade Mark of International Business Machine Corporation.

PURSUIT
COMPUTER SYSTEMS
LEVEL 7, 608 ST. KILDA ROAD, MELBOURNE 3004

PHONE: 51 2353

**Strangled by
the limitations
of your DBMS?**



ZIM. The system for serious developers

Your data base system was easy to learn. You were building your first simple applications within hours. You have a menu driven interface and pop up menus with online context sensitive help. Now you are ready to build your first real application. Instant Strangulation!

The Symptoms

- There is no real 4th Generation Language — what you see at the menu driven level is what you get.
- There are all sorts of built-in limitations which no real problem ever obeyed
- Your database which runs like a superstar on a few files and 500 records, chokes when faced with several files of 50,000 records
- You cannot efficiently run your applications in UNIX, VAX VMS and MS-DOS without major surgery, or finding a new DBMS

- Your DBMS supplier asks, "what is networked multiuser anyway?"
- Your database is too big to live on one disk but your DBMS doesn't support multiple disks
- Your database can't answer simple questions like "tell me which inventory items have NOT sold in the past 3 months?"
- You built your application using the nice easy interface, but now it won't get out of the way to allow you to modify the application
- You can't compile your applications and there is no runtime system

Diagnosis

Extreme stress and frustration in your development staff and applications crippled at birth.

THE CURE

ZIM is the 4th Generation Language/DBMS for serious application developers. ZIM is a top performer in all of its environments (UNIX, XENIX, MS-DOS, Novell Networks, VAX VMS, QNX), for all types of information application. ZIM's easy menu driven interface with context sensitive help is not meant just for novice users, and it stays discreetly out of the way when it isn't needed.

You need never suffer the symptoms of Database strangulation again.

Clarity

Financial Services Software

20th Floor, Royal Exchange,
56 Pitt Street, Sydney, N.S.W. 2000.
Telephone: (02) 241 3385. FAX: 251 1708.

ZIM™

IN ASSOCIATION WITH TILLINGHAST Division of TPF&C • AUSTRALIA • BER MUDA • CANADA • FRANCE • SWEDEN • UNITED KINGDOM • UNITED STATES

THE LES BELL ENCYCLOPAEDIA OF BATCH FILE PROGRAMMING — Part 1

Everyone thinks Les is a dedicated CP/M hacker — not so, he insists; he just spends more time using CP/M and more time programming for DOS. To prove his point, he put together a few techniques he's been using. This is the first instalment of his two-part encyclopaedia.

BATCH FILES? What are they? Batch files are text files containing, at the elementary level, sequences of DOS commands and programs to be run. The most common use of batch files is to ensure that a sequence of commands is executed correctly without relying on the user's memory to get it right.

For example, some software packages require you to use the back-up command on the subdirectories only, and not back up the root directory of their hard disk. In this case, you could perform the job manually by issuing a separate back-up command for each subdirectory:

```
C:\FW>BACKUP C:\BIN A: /S
C:\FW>BACKUP C:\FW A: /S
C:\FW>BACKUP C:\DB3 A: /S
C:\FW>BACKUP C:\C86 A: /S
```

This is fine as long as you have a good memory and can be sure you (or the user for whom you have set up the PC) will remember to back up all the subdirectories. You might also wonder if you have the patience to type in all those commands — but you'll have to sit there anyway, feeding floppy disks into the machine, so typing the commands is not a great inconvenience. However, if the back-up commands worked without human intervention, waiting around just to type the commands would be a real pain in the ...

You can solve the problem with a batch file; just create a text file called BACKALL.BAT, with the back-up commands in it:

```
BACKUP C:\BIN A: /S
BACKUP C:\FW A: /S
BACKUP C:\DB3 A: /S
BACKUP C:\C86 A: /S
```

You can do this with your favourite editor or word processor (provided it can edit ASCII text) or with EDLIN if you have to, or you can simply copy the file from the keyboard into the file:

```
C:\FW>COPY CON BACKALL.BAT
BACKUP C:\BIN A: /S
BACKUP C:\FW A: /S
BACKUP C:\DB3 A: /S
BACKUP C:\C86 A: /S
^Z
<- press Ctrl and Z together here
1 File(s) Copied
C:\FW>
```

Now, typing the name of the batch file will invoke it, causing DOS to execute each of the back-up commands in turn —

```
C:\FW>BACKALL

C:\FW>BACKUP C:\BIN A: /S
      (etc)
      .
      .
      .
C:\FW>
```

There are a few rules about the names you give batch files or, more particularly, about the way DOS searches for program files (which includes batch files).

When you give a command at the DOS prompt, like this:

C:\FW>DO SUMMAT

you are presumably trying to invoke a program called DO, to operate on the file SUMMAT. DOS will search the current (sub)directory for the file DO.COM and, if it finds it, will load and run the program. If DO.COM is not found, then DOS searches again for DO.EXE and will load and run this program if possible.

If neither of these files is found, DOS searches for a batch file called DO.BAT, and if this is found, it invokes the batch file processor and runs DO.BAT.

If none of these files is found, DOS will then repeat this search pattern for each of the (sub)directories named in the current search path. This can be displayed and set using the PATH command.

To summarise, DOS's search process is as follows —

1. In the current directory, search for a .COM file;
2. In the current directory, search for a .EXE file;
3. In the current directory, search for a .BAT file;
4. For each subdirectory in the PATH —
 - a. Search for a .COM file,
 - b. Search for a .EXE file,
 - c. Search for a .BAT file;
5. If none of the above succeeds, print an error message.

The implication for batch file naming is that you cannot give a batch file the same name as an existing .COM or .EXE file, unless that other file comes later in the search path. For example, we could not have named our back-up batch file BACK-

Batch Files

UP.BAT, since then the BACKUP commands in the batch file would simply reinvoke the batch file repeatedly, causing the system to hang up.

Under DOS 3.0 and later, it is possible to give batch files and programs the same name and distinguish between them by prefixing the name of each with the appropriate path, or by using the SUBST command. I'll give an example of this later.

Elementary Batch Commands

By simply placing a list of DOS commands or programs to be invoked into a batch file, you can automate the most common procedures under DOS. However, the results are not terribly elegant, nor can you do things like prompting the user to change disks. However, DOS provides a number of commands, in most cases special to the batch processor and not available from the DOS prompt, which make these things possible. The first three of these are ECHO, REM and PAUSE.

ECHO has two purposes. First, it can be used to turn on and off the echoing of DOS commands to the console. In the example above, each separate BACKUP command was visible, making it clear that a series of programs was being run, rather than a single one. To make it look like a single program, add ECHO OFF at the beginning of the line. This suppresses the echoing of commands to the screen. Naturally, ECHO ON turns it on again, and when the batch file ends, echoing is turned on again for the next batch file.

The second use of ECHO is to display messages for the user. For example,

ECHO Please insert transfer disk in A:
will display the message
'Please insert ... A:'
on the screen.

There is a bug in the batch file processor: if the last line of your batch file does not have a carriage return at the end, it will be echoed anyway, regardless of the state of the ECHO switch.

The REM command is similar to ECHO, except it is used to insert comments into the batch file. If ECHO is set ON, the REM comments will appear as the batch file runs, but if ECHO is OFF, the REM comments do not appear.

Finally, the PAUSE command displays the message

Strike a key when ready ...

and halts execution temporarily. This is used to allow you to change disks, and is usually preceded by some kind of ECHO message.

What's my Percentage? — Elementary Parameters

A common use for batch files is to run compilers. For example, I commonly use the Computer Innovations Optimising C86 C compiler, which is actually four separate programs which have to be run in sequence. So, to compile the program WX2.C, I must give the commands:

```
C:\C86>CC1 WX2
C:\C86>CC2 WX2
C:\C86>CC3 WX2
C:\C86>CC4 WX2
```

(the output of the compiler passes is not shown.) Obviously, this is an ideal candidate for a batch file, called MAKEWX2.BAT:

```
ECHO OFF
CC1 WX2
CC2 WX2
CC3 WX2
CC4 WX2
```

There are a couple of problems with this batch file. First, what if I now want to compile the program SR.C? Do I now have to create a new batch file with different commands called MAKESR.BAT which would look like —

```
ECHO OFF
CC1 SR
CC2 SR
CC3 SR
CC4 SR
```

Furthermore, what if the first pass of the compiler discovers a syntax error in my program? It will produce an error message, telling me what's wrong, but then CC2, 3 and 4 will run, and they will either produce error messages, pushing the first, helpful, message off the screen or (much worse) they will run normally on the files left over from the previous compilation, pushing the error message off the screen and leaving me with an unchanged program!

Let's deal with the first problem. Batch files can be created which do not have the names of files and disk drives embedded within them, but which instead are given these **parameters** at the time they are run. A parameter is something that changes each time the batch file is run, and which is given to the batch file by typing it on the command line which runs the batch file.

To do this, we modify either of the MAKE???BAT files above, by replacing the filenames with a parameter. The resulting batch file, MAKE.BAT, looks like this:

```
ECHO OFF
CC1 %1
CC2 %1
CC3 %1
CC4 %1
```

The '%1' symbols stand for the first word on the command line after the batch file name itself (this can be referred to as %0). So, to run this batch file to compile WX2.C, we invoke it with the command line

C:\C86>MAKE WX2

while to use it to compile SR.C, we type

C:\C86>MAKE SR

In each case, the word after 'MAKE' on the command line (WX2 or SR) replaces %1 in the batch file, which then issues the correct commands to compile the appropriate file. You can see that this is so by removing the ECHO OFF command.

Advanced Batch Commands

You can make batch files even more powerful by using some batch commands which are more usually found in programming languages. These allow you to test for various conditions or to loop around, repeatedly executing commands on different files.

The first command is the GOTO command. This transfers control to the command after the label which is the target for the GOTO. A label consists of a colon (:) followed by a word, as the first thing on the line of the file. Here's a short (nonsensical) example:

```
ECHO OFF
ECHO This should be printed
GOTO OVER
ECHO This should never be printed
:OVER
ECHO Now we're finished
```

Obviously, GOTO by itself is not much use; it has to be used in conjunction with other statements. In fact, in batch files, the only command which is used in conjunction with GOTO is the IF command, which comes in several variations.

The first IF variation allows you to test whether a file exists; this is useful in backup batch files, compiler control batch files and others. Let's see how it can be used with Lattice C, for example, to take care of errors in compilations: ▶

Batch Files

```
ECHO OFF
ERASE %1.Q
ERASE %1.OBJ
LC1 %1
IF NOT EXISTS %1.Q GOTO ERR
LC2 %1
IF NOT EXISTS %1.OBJ GOTO ERR
LINK C+%1,%1,,LC.LIB
GOTO OVER
:ERR
ECHO Error compiling %1.C
:OVER
```

Here there are two passes of the compiler; the first one reads a file with a .C filetype and produces a corresponding .Q file, while the second reads the .Q file and produces a .OBJ file, which is then linked with the C compiler library to produce the desired .EXE file.

If either pass of the compiler discovers an error, it will not produce its output file, and we rely on this fact to control the batch file and jump to a command which prints an error message. Notice, if everything works okay, we have to jump past the error message so it doesn't appear.

Notice also that although the compiler may discover an error and not produce an output file, there may be an existing output file from a previous compile. We must therefore delete any such files before starting, otherwise our logic won't work.

Finally, notice that the IF EXISTS test can be modified to work 'backwards' by using the 'NOT' modifier, which makes it perform a GOTO if the specified file does not exist. The NOT modifier can also be applied to the other IF tests.

There is a better way of testing for errors after programs have run, but the programs have to be written specially to take advantage of it. This uses a special 'system variable' called the ERRORLEVEL, which is set by some programs as they return control to the operating system: a value of zero (0) indicates normal program termination with no errors, while a value of one (1) or higher indicates some error. In general, the higher the ERRORLEVEL value, the more severe the error.

Batch files can test for errors with the IF ERRORLEVEL statement. For example:

```
IF ERRORLEVEL 1 GOTO ERR
```

but notice that this is read as 'if errorlevel greater than or equal to one goto err'. In other words, execution will continue normally if the ERRORLEVEL is zero, but will branch to :ERR if it is one or greater. Here's an example of a smarter batch file for the C86 compiler:

The implication for batch file naming is that you cannot give a batch file the same name as an existing .COM or .EXE file, unless that other file comes later in the search path.

```
ECHO OFF
CC1 %1
IF ERRORLEVEL 1 GOTO ERR
CC2 %1
IF ERRORLEVEL 1 GOTO ERR
CC3 %1
IF ERRORLEVEL 1 GOTO ERR
CC4 %1
IF ERRORLEVEL 1 GOTO ERR
LINK %1,%1,,C86S2S
GOTO OVER
:ERR
ECHO Error compiling %1
:OVER
```

This works because each pass of the Computer Innovations compiler sets the ERRORLEVEL as it exits.

The final variation on the IF command allows comparison of strings. Its basic format is:

```
IF 'string1'=='string2'
```

There are a couple of points to notice

```
echo off
if '%1'==' ' goto explain
cc1 %1 %2 %3 %4 %5
if errorlevel 1 goto err
cc2 %1
if errorlevel 1 goto err
cc3 %1
if errorlevel 1 goto err
cc4 %1
if errorlevel 1 goto err
link %1,,NUL,c86s2s
goto done
:err
echo error compiling %1
goto done
:explain
echo usage:-
echo cc file [flags]
echo example:- cc hello.c -hc:\c86\c:\ -i -x
echo this batch file assumes that you are using
echo the c86s2s library (small model, dos2, software f.p.)
echo and LINK.EXE to link
:done
```

Figure 1

about this. First, the two strings must be enclosed in quotes, and secondly the comparison operator is '=='; that is, double equals signs and not a single equals like in most other languages.

This can be used in batch files in a variety of ways. For example, a batch file which cleans up a subdirectory by copying files to a floppy disk might optionally delete .BAK files like this:

```
IF '%3'=='DELETE' ERASE *.BAK
```

Notice the parameter must be enclosed in quotes, since it is simply picked up off the command line when the batch file is invoked, like this:

```
C: C86>CLEANUP *.DOC A: DELETE
```

Another use for string comparison is testing to see whether the user has supplied certain command-line parameters. For example, Figure 1 shows the full batch file, CC.BAT, which I actually use to drive the Computer Innovations compiler. Notice the use of the test -

```
if '%1'==' ' goto explain
```

which tests to see if %1 is a null string, and if so, explains the correct usage of the batch file.

The final complex batch command is FOR. This is similar in some respects to the FOR loop in BASIC, in that it allows repetitive looping inside batch files — and more. Its basic format is -

```
FOR pvarname IN (parmlist) DO command
```

where pvarname is a pseudo-variable name and parmlist is a list of parameters, such as filenames. A pseudo-variable name is rather like a command-line parameter, except that it is not just numbered, it is also named, and takes the form of two per cent signs and the name: %%-name. The parameter list can include filenames, keywords, commands, and even command-line parameters like %1, %2 and so on.

For example, suppose we wanted to separately compile and then link together three C language source files. We could do it by removing the link command from the batch files shown above, running the batch file three times and then giving the link command manually.

A better way to do it, at the expense of

Batch Files

error checking, would be to construct a batch file using the FOR command as shown in Figure 2. This will compile the three files PROG1.C, PROG2.C and PROG3.C, and then link them with the compiler's library to produce the program MYPROG.EXE. Of course, a more versatile way to do this would be to create the batch file shown in Figure 3, which I'll call MAKE3.BAT, which allows you to invoke the file with a command line like

```
C: C86>MAKE3 IMAIN SFUNCS  
IFUNCS INDEX -2 -F
```

This will compile the first three files (IMAIN.C, SFUNCS.C and IFUNCS.C) to produce the program INDEX.EXE. The -2 and -F parameters are command line options for the compiler, causing it to produce code optimised for the 80286 processor and use 'frugal' optimisation, respectively.

The price paid for this flexibility is error checking, but we shall investigate ways to improve this later.

The SHIFT command is the last command supported by the DOS batch pro-

```
ECHO OFF  
FOR %%VAR IN (PROG1 PROG2 PROG3) DO CC1 %%VAR  
FOR %%VAR IN (PROG1 PROG2 PROG3) DO CC2 %%VAR  
FOR %%VAR IN (PROG1 PROG2 PROG3) DO CC3 %%VAR  
FOR %%VAR IN (PROG1 PROG2 PROG3) DO CC4 %%VAR  
LINK PROG1+PROG2+PROG3,MYPROG,,C86S2S
```

Figure 2

```
ECHO OFF  
FOR %%VAR IN (%1 %2 %3) DO CC1 %%VAR %5 %6 %7  
FOR %%VAR IN (%1 %2 %3) DO CC2 %%VAR  
FOR %%VAR IN (%1 %2 %3) DO CC3 %%VAR  
FOR %%VAR IN (%1 %2 %3) DO CC4 %%VAR  
LINK %1+%2+%3,%4,,C86S2S
```

Figure 3

cessor. With standard batch file parameters you can only have 9 parameters, plus the batch filename; that is, %0 to %9. %10 is viewed as %1 immediately followed by a 0. The SHIFT command has the effect of discarding the current %0 (you probably didn't need it anyway) and putting %1 in its place. Then %2 is shifted into %1, %3

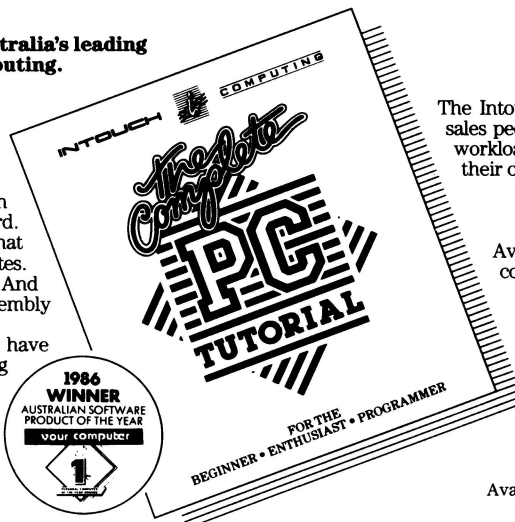
into %2, and so on until finally what would have been the inaccessible %10 is shifted into %9.

Now, batch files with 10 or more parameters are a bit mind-boggling to contemplate, but SHIFT could be used in conjunction with FOR loops. However, I've never needed it so far. ▶

“Probably the best introduction to the IBM PC I have ever seen.”

— Les Bell, one of Australia's leading
authorities on computing.

To add weight to Mr. Bell's observation, the Intouch Complete PC Tutorial recently won the 1986 Australian Software Product of the Year award. It is not surprising for a programme that can teach a beginner to use DOS in minutes. Have operators programming in hours. And have enthusiasts conversant with assembly language in days. Already this year, 10,000 Australians have improved their computer literacy using this program and the unique 'window' technique it uses. This allows the operator to use the application program on the screen and see the tutorial window simultaneously. It makes learning child's play.



The Intouch Complete PC Tutorial has helped sales people, teachers and students halve their workload. While it has helped managers double their output.

Available from all reputable
computer stores.



**INTOUCH
COMPUTING**

1 Kent St, Bicton. W.A. 6157
Phone: (09) 339 4431

Available for IBM, PC, XT or 100% compatibles.

CHARLIE'S 0175

Batch Files

```
REM Loop processor for various files
ECHO OFF
FOR %%X IN (CH1.DOC CH2.DOC CH3.DOC CH4.DOC CH5.DOC) DO CD %%X
REM CD.BAT - Copy file then delete it
COPY %1 \ARCHIVE\%1
DEL %1
```

Figure 4

Extending Batch Processing

The IF and FOR commands give considerable flexibility in controlling the execution of individual commands. To control the execution of sequences of multiple commands, we have to use GOTO, which the experienced programmers amongst us recognise as **A Bad Thing**.

The lynchpin of good programming practice is the ability (and the desire) to have subroutines or procedures. This applies to all programming languages, from BASIC to C and PL/I, including DOS batch files.

Now, surely in batch files all you have to do to get subroutines is have one batch file call another? Sounds fine in theory. We could write a pair of batch files to, for example, copy files to a new subdirectory and then delete the old version as shown in Figure 4.

If you try this, you'll find it doesn't work. Naming one batch file inside another works like a GOTO; control transfers to the named batch file but then never returns, so the batch file terminates at the end of the 'subroutine' batch file.

How, then, can you call one batch file from within another? You can, but the technique is well hidden in the DOS manuals. The secret is that each batch file requires its own copy of the batch file processor to run correctly. When it terminates, its copy of the batch file processor disappears from memory and control returns to the batch processor for the calling batch file, which then resumes where it left off.

The batch file processor is part of the resident portion of the COMMAND.COM program. You can invoke a new copy of COMMAND.COM and pass it a command (like a batch file name) by using the command

COMMAND /C command line

A version of the batch files given above which would work is shown in Figure 5. Notice there is an ECHO OFF statement in both batch files; this is because CD.BAT starts running under a completely fresh copy of COMMAND.COM which has ECHO set ON.

In practice, copies of COMMAND.COM inherit a lot of information about the current DOS set-up — it's just that the current state of ECHO is not part of that. In particular, COMMAND.COM manages an area of memory called the environment, in which various strings are stored which control the way DOS operates. You can see these strings by typing SET and pressing return; this will display the contents of the environment:

```
C:\C86>SET
COMSPEC=C:\COMMAND.COM
PATH=C:\;C:\BIN;C:\C86
PROMPT=$p$g
C86TEMP=f:
```

As you can see, all environment strings take the form varname=string. Some are obvious, like PROMPT=, which saves the current prompt string which sets the DOS prompt, and PATH=, which is set by the PATH command in your AUTOEXEC.BAT file (what do you mean, you don't have a PATH command in your AUTOEXEC.BAT file?). Others are specific to particular packages, like the C86TEMP variable, which specifies where the C86 compiler will put its temporary files (drive F: is a memory disk, for speed). Finally, the COMSPEC string, which is present on all systems, specifies from where COMMAND.COM will reload its non-resident portion if it should be overwritten.

The important point is that copies of COMMAND.COM receive a copy of their parent's environment, and therefore have access to all these variables. But because it is a copy of the environment, changing any variables will have no effect on the parent's environment. In other words, variables are local, not global.

However, there is one way in which a copy of COMMAND.COM can affect its parent, and that is through the ERRORLEVEL variable. When a copy of COMMAND.COM terminates, it returns its current ERRORLEVEL value to its parent, so that if this batch file encountered an error the

calling batch file knows about it, too.

It is possible to make batch files interactive, in other words, to make them ask questions. The easiest way to do this is with the ERRORLEVEL, by writing a short program which asks for a yes or no response and sets the ERRORLEVEL accordingly. Such a program, ASK.COM, is in the public domain, in the PC/Blue user group public domain library and available from user groups around the country.

ASK.COM asks the user for a Y/N response and sets the ERRORLEVEL to 0 for a Y response and 1 for N. This can then be tested by an IF command. For example, I use this technique in my AUTOEXEC.BAT file:

```
echo off
path c:\;c:\bin;c:\c86
xtime
prompt $p$g
set c86temp=f:
subst g: c:\bin
echo Want Sidekick loaded?
ask
if errorlevel 1 goto nosk
sk
:nosk
```

This sets things up on my system, and then asks if I want Sidekick loaded into memory. If I answer with a Y, then SK.COM is run, otherwise execution jumps past this point. This technique can be extended to allow menus to be constructed.

Listing 1 shows a C version of the ASK program, written for Computer Innovations Optimising C86. This version compiles to rather a large size at 10 Kbytes — not really a problem, but the public domain version is rather neater at 256 bytes. The problem is that I'm too lazy to write any assembly language if I can avoid it: the C version took 10 minutes to write, while an assembler version would have taken me hours.

Likewise, Listing 2 shows a C program called CHOOSE.C. This allows you to enter a single digit as a menu choice, and then sets the ERRORLEVEL to that value. This program could easily be extended to allow selections higher than 9. Figure 6 shows a menu batch file which uses the CHOOSE.EXE program.

Members of the Your Computer Bulletin Board can download Les's listings from that most useful facility. (Sign up now or be doomed to a lifetime of typing.) □

```

echo off
:start
cls
echo
echo                                     Main Menu
echo 1 - Run WordStar
echo 2 - Compile choose.c    <
choose
if errorlevel 2 goto mc
if errorlevel 1 goto dows
if errorlevel 0 goto done
:mc
command /c cc choose
goto start
:dows
command /c ws
goto start
:done

```

Figure 6

```

/* CHOOSE.C - set ERRORLEVEL interactively */
/* Programmed by LB */

```

```

#include "stdio.h"

main()
{
    int choice;
    static char temp[] = (" ");

    if((stdin = fopen("CON","rb")) == NULL) {
        abort("ask: Unable to open console stream");
    }

    fputs("Please enter your choice: ",stdout);
    while(!isdigit(temp[0] = getchar()));
    choice = atoi(temp);
    putchar('\n');
    exit(choice);
}

```

Listing 2

```

/* ASK.C - set ERRORLEVEL interactively */
/* Programmed by LB */

```

```

#include "stdio.h"

main()
{
    int answer;

    if((stdin = fopen("CON","rb")) == NULL) {
        abort("ask: Unable to open console stream");
    }

    fputs("Press Y or N: ",stdout);
    while(((answer = toupper(getchar())) != 'Y') && (answer != 'N'));
    putchar('\n');
    if (answer == 'Y') exit(0);
    else if (answer == 'N') exit(1);
}

```

Listing 1

Thanks to Les Stein, you don't have to be an Einstein to understand and operate a computer.

Les Stein describes this new tutorial as, "taking your hand and guiding you through the computer fog."

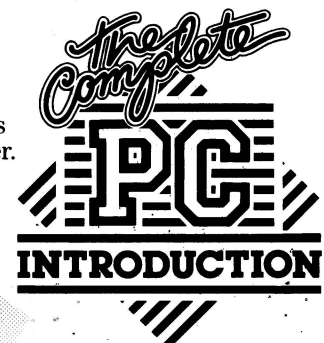
The computer acts as a friendly teacher. Windows pop up on the computer screen to instruct you through all the steps you need to get the machine to work and do your bidding. The Complete PC Introduction lets you jump in at your right level, switch to other topics, and even saves your place so that you can come back to where you left off.

Les Stein entertainingly takes you through the computer basics of explaining the functions of keys on the keyboard to understanding the Disk Operating System to using DOS and finally the "expert" section where you create and use batch programmes.

Says Les Stein, "Using your computer will be like slipping into a warm bath when you complete The Complete PC Introduction."

Ask your local retailer for your copy today.

Les Stein —
One of Australia's
foremost authorities
on the P.C. computer.

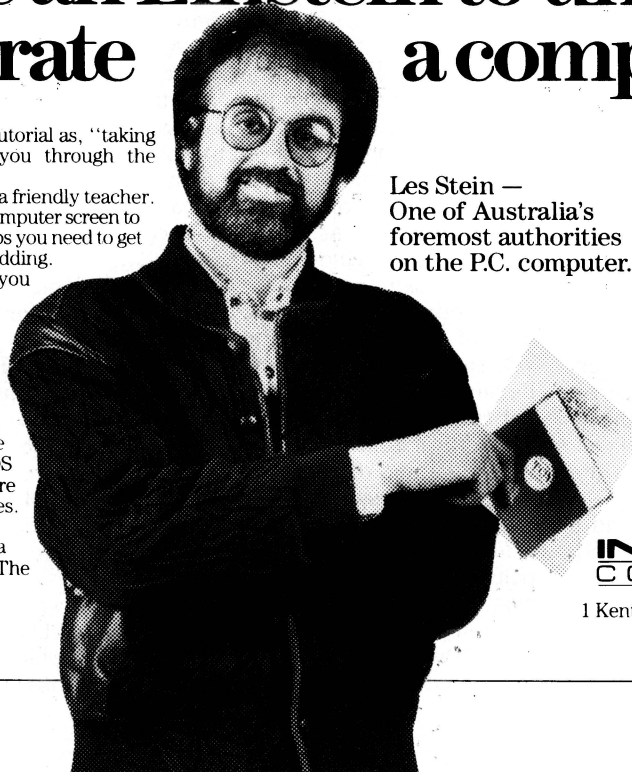


Available for IBM PC or 100% compatibles.

INTOUCH COMPUTING

1 Kent St, Bicton. W.A. Ph: (09) 339 4431.

CHARLIE'S 0195



Sugar's Baby

When does a new MS-DOS machine stop being a clone or outright copy and start being a boldly innovative workalike? I suspect the answer is 'Shortly after Alan Sugar's engineers at Amstrad get their hands on it'.

My introduction to Amstrad was in January 1986 when I reviewed the Amstrad PCW8256, a CP/M-based unit designed primarily as a word-processing plant. The PCW8256 broke new ground in design features, and the latest offering — or set of offerings — also makes giant leaps forward in many areas.

My first impression as I unwrapped the new toy was surprise at the lightness of its construction. It is a small machine, with a footprint about two-thirds the size of a regular PC, and the case is constructed totally of plastic. It feels rigid and strong nonetheless. The top of the computer has a recess large enough to fit the base of the monitor and includes a slot for four pen-light cells to power the real-time clock and battery-backed RAM. The front panel contains a single half-height disk drive, located in the middle of the right-hand side, with provision for the second drive on the opposite side.

Those of you familiar with what we accept as 'normal' PC configuration will by now doubtless be asking "If the drives take up the whole of the front panel, where will I fit full-length cards?" Good question. Close examination of the back of the machine, as an alternative to reading the manual, shows the rear quarter of the top lifts off to display three expansion slots running transversely across the rear of the machine. Now that's lateral thinking! Not only does it allow a much smaller footprint, but it allows easy access without disassembling the entire beast.

The monitor, in this case mono (and I mean *mono* — sparkling black and white!) sits on a tilt-and-swivel base which fits neatly into a recess on the top of the machine. The power cable runs from mains to the monitor and two cables join it to the computer. The power switch is on the back

of the monitor and this powers up the entire kit. The cable length is just sufficient for the monitor to mount in this manner and there are some applications where the monitor might be more conveniently located further away than this cable allows. The two monitor cables, and the RS232 and parallel interface plugs are all on the rear of the unit, but both the mouse and keyboard plug into the left-hand side of the main case. A joystick interface is provided on the right rear of the keyboard, much more convenient than the traditional 'buried in the rear' standard.

The keyboard is made of the same rigid plastic and closely follows the IBM layout. Minor differences in the placing of some of the control keys made touch usage unusual at first, but it's close enough for anyone to adapt to quickly. The Caps-lock and Num-lock keys both have red LEDs on them and the tilt angle of the board is adjustable. The keyboard weighs little, but shows no tendency to wander around the desk during use. It's clipped together and I couldn't resist taking it apart. As with most modern electronic equipment, there is not a lot in there, but its comforting to know it's easy to get to. The cable connection is coiled and allows you to work at a respectable distance from the monitor.

The first monitor I tried was the black and white mono. As the Amstrad comes equipped with a colour board as standard, the monitor is capable of displaying all the colours as shades of grey. This makes a lot of difference when running software written for colour, much of which would be unreadable without this feature. External controls include contrast, brightness and vertical hold. The face of the monitor is very flat and not recessed at all.

While it's easy to use after the culture shock of returning to mono, I suspect it would make excellent sense to pay the paltry \$400 extra and get the colour version to start with. Under normal conditions, to upgrade to colour from a basic IBM PC would cost around \$435 for a colour board, *plus* up to \$1000 dollars for a

Under the guidance of leading light Alan Sugar, UK company Amstrad has been having remarkable success in uncovering market niches and stuffing them full of Amstrad products. Now, Amstrad has entered the over-stuffed world of IBM compatibles. Can it succeed in this apparently niche-less realm? Ewart Stronach examines ...

monitor capable of displaying the Amstrad's resolution of 640 x 200 pixels with 16 colours. The colour monitor supplied is crisp and clear.

All the software I tried behaved exactly as on my Lingo PC-88 and therefore exactly as it would on a True Blue. The speed of the Amstrad adds a new challenge to most games and makes a percentage of them downright unplayable.

The Heart of the Beast

So much for the appearance, let's look inside —

Removing the rear section where the cards are inserted allows a reasonable look at the architecture. The 8086 is visible, together with a socket for an 8087 co-processor. The space for additional RAM is easily accessible and the slots are within easy reach. There are a number of VLSI (Very Large Scale Integration) chips which indicate this is a total re-think of design rather than a copy.



— the Newly Cloned Amstrad

The power supply is in the monitor, which makes a lot of sense both from the available space in the main case and from the heat position. The mouldings of the case are well designed, affording maximum rigidity with minimum weight. Access to the rest of the machine is more complex with screw heads hidden under lift-out tabs. As the user sections of the Amstrad are so easy to get at, this is not a problem.

The single circuit board appears well-made and clearly marked. The board takes up only about two-thirds of the area of the base and carries, apart from memory chips, just 32 ICs — an incredibly small number. There must be a heap of functions built into the VLSI chips. Disk control comes straight from the mother board with a standard 34-way ribbon to the drive. The connector for the second drive, plus the power cable, are already in place, and while the front panel warns against using anything but Amstrad's upgrade kit,

I feel sure any proprietary drive could be fitted, as the disk-control chip is standard.

A machine with two drives costs \$450 more than the single-drive version, and if my supposition is right, many users could upgrade for a lot less. The single drive fitted is covered with a case of what appears to be light-gauge zinc-coated steel. Whatever it is, it acts as an efficient RF shield. I have a portable phone which I use as a benchmark for RF interference. There are many machines which almost preclude the use of this phone, but the Amstrad hardly affects it.

Choose Your Environment

In operation in the MS-DOS mode the machine appears identical to Big Blue. The operating system supplied with the machine is Digital Research's GEM (Graphics Environment Manager), and it gives a novice an easy introduction to computing without the need for extensive knowledge of normal DOS commands. Now is not the

time to review the software package, but GEM is very like Microsoft's Windows. Both these operating systems effectively hide the operating system inside a set of menu- and mouse-driven 'windows', with functions activated through the mouse.

Personally, I prefer to see a DOS prompt. But then again, I had to learn the hard way and perhaps if introduced to a system like GEM from the start would be happier with it. A nice touch is a utility provided with the GEM suite which allows you to set-up a battery-backed RAM file; this lets you set any number of parameters such as printer ports, mouse-movement scaling, joystick control, initial screen mode, size of RAM disk and more. This lets you easily accomplish a number of tasks usually taken care of by time-consuming batch files.

The system provided for testing was obviously not a production model. There were sundry 'after-thoughts' on the circuit board, and I am prepared to put down the

101 ways to get a big Christmas bonus.

Every specially marked box of Verbatim DataLife minidisks and microdisks now gives you 101 chances to win a special Christmas bonus from Verbatim.

Inside each box is
a coupon which
offers you:

- A chance to win a \$5,000 Christmas bonus.
- 100 more chances to win a \$100 Christmas bonus.

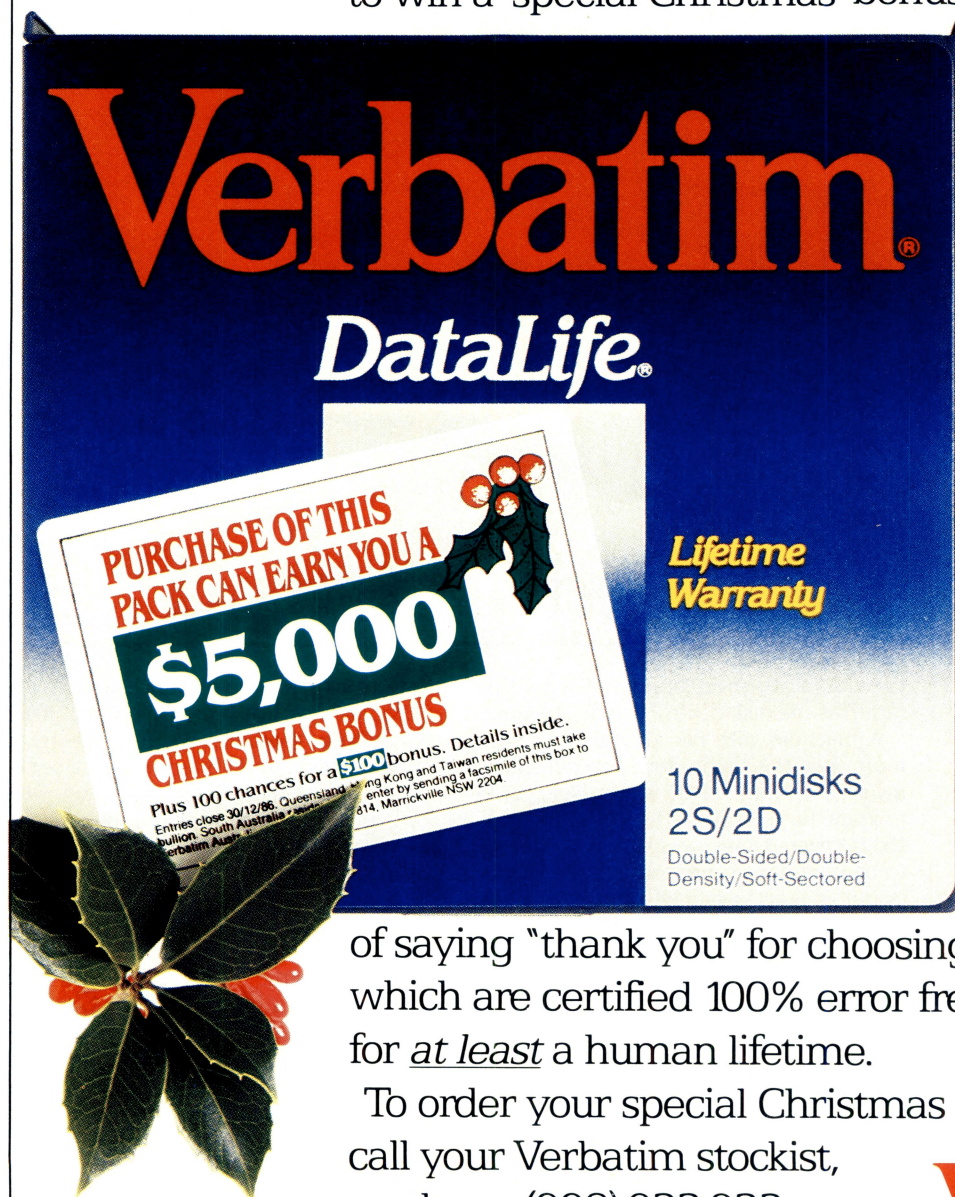
Every pack you buy between now and the end of the year will give you an additional 101 chances to win the bonus money.

It's just our way

of saying “thank you” for choosing the floppy disks which are certified 100% error free and guaranteed for *at least* a human lifetime.

To order your special Christmas bonus packs,
call your Verbatim stockist,
or phone (008) 022 023
for the cost of a local call.

Verbatim.[®]
Word perfect. For life.



Amstrad

few problems I encountered to this fact. Twice during extended operation the machine suffered from the dreaded 'Auto-reboot syndrome'. For no apparent reason it appeared to switch off for a second then return to life at 'power-on' status. Other machines were running from the same power source without problem.

The other minor annoyance was a rather regular failure to read disks on the first or second attempt. Trying the disks in another machine showed no problem and an examination of the disks with Norton's Utilities displayed no bad sectors. However, every program I tried ran without hitch and every indication is that, as Amstrad states, the PC1512 is totally compatible.

Cheap Shots

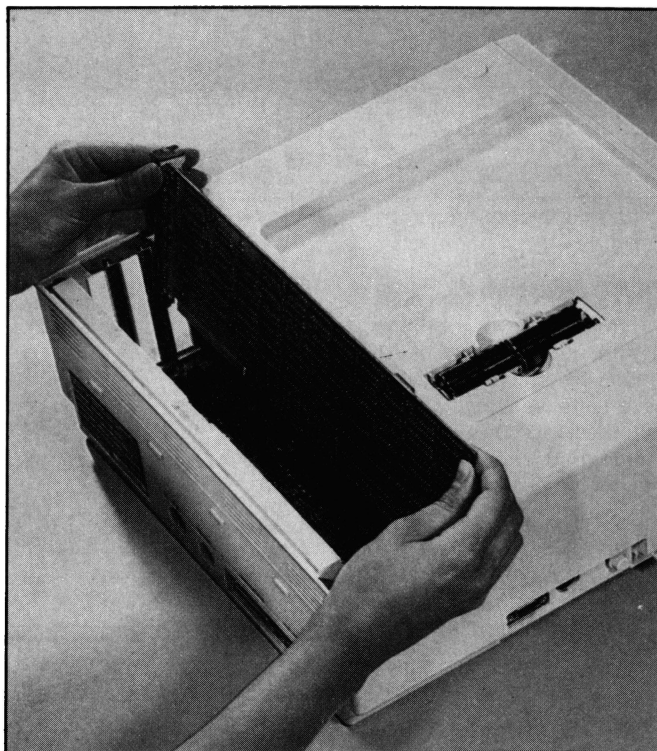
There can be no doubt about value. Amstrad's pricing should make the industry sit up and listen; the company intends to move into the lower end of the business market with aggressive advertising and the support of the Australian parent, AWA.

Our review machine was supplied by the distributor, Mitsubishi Electric AWA of Ryde, NSW. The basic machine comes with an 8086 processor running at 8 Mhz, single 360 Kbyte disk drive, 512 Kbytes of memory (expandable to 640 Kbytes), real-time clock with battery back-up, serial and parallel interfaces, colour graphics board, mouse and joystick ports, three full-length expansion slots, and a monochrome monitor capable of displaying 16 shades of grey. Software includes Microsoft MS-DOS 3.2, Digital Research's DOS Plus with GEM, Gem Desktop, GEM Paint and Locomotive Software BASIC 2 operating under GEM. A detailed user manual is provided. All this for only \$1499!

All the above but with a colour monitor will cost \$1899, while the addition of a second floppy drive to the base model will bring the price up to \$1949. If you want both the colour monitor and the two drives, you'll have to pay \$2349.

Hard-disk models, with 10 and 20 Mbyte capacities, will be released soon.

When you compare this with the alternatives, there is little competition at this stage. The cheapest 'clone' I have seen costs \$1095 for a bare, single-drive, 256 Kbyte machine with no monitor and MS-DOS only (and suspect support). The cost of a monitor varies from about \$150 to \$200 for monochrome and starts at about \$500 for bottom-line colour. The mouse alone could cost you over \$300 if you fall



Lateral thinking! The PC1512s expansion slots run transversely which gives a much smaller footprint and allows easy access.

for Microsoft's 'thimble and pea' trick. Microsoft will not sell a mouse without software, but you can now buy the hardware from other sources for about \$165. The GEM software is advertised at \$299 at discount software houses.

The board takes up only about two thirds of the area of the base and carries, apart from memory chips, just 32 ICs — an incredibly small number. There must be a heap of functions built into the VLSI chips.

At the top end of the scale a phone call to a local IBM supplier elicited the following prices: bare IBM XT with twin drives and 256 Kbyte memory — \$3942; memory upgrade to 512K — \$455; mono video card — \$381; mouse — \$275. That's a total of \$5053, without software, for a comparable machine.

I would have preferred to see a basic business package of software rather than

the GEM suite, but Amstrad assures me its software prices will be as keen as its hardware. The Amstrad comes with a 90-day warranty, with an option to purchase an extended warranty with on-site service for 12 months for a very reasonable \$125.

I see the Amstrad PC1512 in a dual role. Firstly, as a viable bottom-line business machine — with all the capability of MS-DOS machines at up to four times the price, and the added security of backup and warranty from a well-known organisation. In this office environment it should also be a clear contender as add-on equipment to existing units in the form of terminals or workstations. The PC1512 would make a superb network member, regardless of the brand of the host.

The second application is, of course, in the home. There are many home users who have outgrown the 'toy' computer and must make the decision which upgrade path to follow. The software base available for IBMs and compatibles makes the PC/MS-DOS world a logical choice, and the Amstrad comes in at the affordable end of the scale. I can hear the Apple users howling for blood in the background, but feel that as an introduction to serious business use, you can't beat MS-DOS. And don't we all kid ourselves we are buying our toys so our children will go out into the workplace, familiar with a system used in a large percentage of offices. □

Performing AT

PERFORMANCE! That's what we like, and that's what we got (in *big* doses) with our latest set of AT comparison tests. Every time we run a set of these tests we marvel at the latest advances in desktop power, but we need only wait a month or two until a new group comes up for judgement and the old standards are wiped.

Will it never end? We certainly hope it's not gunna!

This time around we didn't find a new overall leader — it would be damned hard for anyone to trounce the Earth Computer Systems machine which put itself so far in front of the pack in our last comparison — but the four machines tested wedged themselves into the top six of the more than 20 ATs we've had under the stop-watch so far.

And in most cases they provided that performance at a price that puts their 'bang for the buck' rating well out in front.

Video Technology's locally assembled machine was a stunner, sandwiching itself between our former giant-killers, the ECS and ITT's Xtra XL, for second place overall. Just behind the ITT came Keller Automation's Micro 10, followed closely by the

Maybe the TI, maybe the Kaypro said Matt after his first session ATtesting in our January Yearbook; maybe the Micro Five, maybe the President, and then again . . . he concluded in our May Shootout; September's Duel gave us a definite 'Hmmm' and this month? Matt's done wheelies with four more hot rods and found a solution to his fickle!

new Osborne SP and Sperry's beautifully compact Micro IT (yes, that's Micro *eye-tee*, not it as in *thing*.)

Back AT the Beginning

This issue's AT comparison started out to be a 'square-off' session, with updates on some of our past players.

First, we wanted to test the latest 8 MHz IBM, as we've been comparing the challengers to the original machine for a year now.

It's certainly time for an update but, despite our best intentions, IBM couldn't deliver. Next time, we mumble to ourselves . . .

We also wanted to re-run the Micro Five tests. Those who've followed this performance epic will remember we tested the first Micro Five landed by Archives, and couldn't clean up the too-full hard disk in the short time available to us. We expect the machine to record noticeably better figures when tested under the same conditions as the rest of our ATs, but again we'll have to wait — the company couldn't hold one back from its anxious customer long enough for us to run the tests on a new unit.

It's a tribute to this machine's potential that only now, after this issue's tests, has it been pushed further from the top of the table than third.

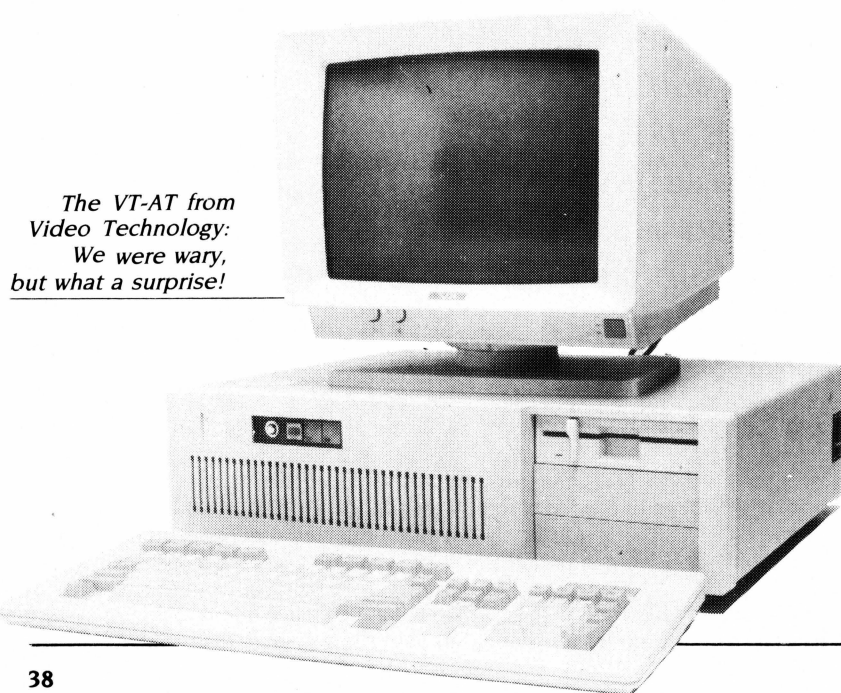
Our final 'catch-ups' succeeded. After a dismal early performance from Osborne we were finally given the latest machine — it redeemed the Osborne name in a spectacular fashion. And Sperry, whose delightful PC/IT had slipped down the lists in the face of increasing recent competition, delivered its latest gem, the Micro IT.

WhAT's So Special?

As before, we don't want to waste space telling you about these machines' similarities to all the other ATalikes, so we'll just look at different or interesting aspects of their design:

Video Technology VT-AT: Well, was this one a surprise! We're wary of anyone who claims to locally assemble machines, wondering why they would bother, but these days it does seem to have some real advantages.

First, it's probably economical now that our costs are competitive on a world scale. But — most importantly — it can allow



*The VT-AT from
Video Technology:
We were wary,
but what a surprise!*

Speed!

The development of a great design without the associated R and D and tooling costs.

Video Technology buys parts selectively from the USA, as well as Asia, to enable it to put together a machine with specs well ahead of your typical clone. For example, it has no less than four serial ports, plus one parallel, all built into the main board — no slots wasted, and ready for multi-user operation out of the box.

The VT machine comes with a 40 Mbyte Miniscribe voice-coil hard disk (they are *quick*), a floor stand for 'tower' operation, two years warranty (that beats the 90 days — if you're lucky — of many of the others!) and the availability of an on-site service contract, handled by Olivetti, for a meagre \$730 for two years.

We would almost suspect that the Video Technology people built the test unit specially to impress us, so high was the finish quality.

(That sort of 'clever trickery' is just as lacking as real marketing in the fledgeling computer industry, perhaps because few of the testers would know the difference if they ever opened the machine. However, one of these days the computer industry will grow up, at which stage I expect I could earn a lot of money teaching them some of the proven tricks of the motor industry.)

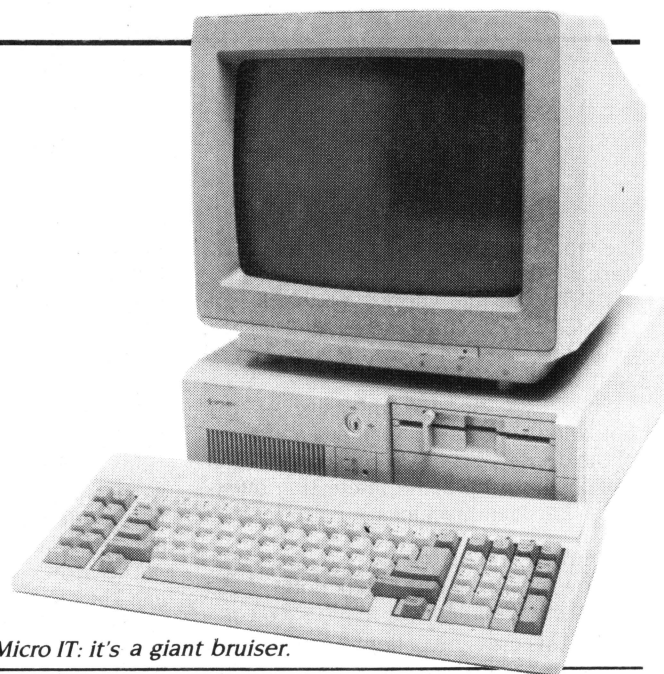
Osborne SP: There was little about our test Osborne to make it stand out from the crowd — until we fired it up! The SP stands for Special Performance, and it does...

In fact, the machine we tested was a prototype mounted in a very standard, boring AT-clone case — the production model will feature a much more stylish tower-mount casing and a desktop version will also be available.

As you'll see, it matters little how the Osborne looks — its price/performance balance is outstanding.

Keller Micro 10: Victoria's Keller Automation provided another surprise packet for our tests — on the outside another bland AT box, on the inside a spirited performer with a few special features.

It looks impressive, and it is, although pricing is starting to look a fraction steep up against the latest crop of competitors



Sperry's compact Micro IT: it's a giant bruiser.

(the 'way under \$10,000' price is without the hard disk!).

Interesting features include the ability to select wait states as well as processor speed, the wide range of options including huge and very fast hard disks, provision for up to 15 Mbytes of RAM, built-in serial and parallel ports, and an external reset button.

Sperry Micro IT: What a delight! After all these giant, desk-filling standard ATs, the 'baby' Sperry, with its smaller-than-a-PC footprint, is a refreshing change.

The super-compact design (Sperry's heavyweight high-resolution monitor almost dwarfs it) fits almost every feature of a standard AT into a box of less than half the volume, with very few compromises.

The one noticeable drawback is the limitation on expansion slots — boards slide sideways (horizontally) into the machine, so its height holds you to five slots. That won't be a problem for many people, where the size of a full-scale AT often is. Sperry's approach makes sense — for the 'power-user' who wants a fast desktop the Micro IT is ideal, while the users who want expandability for multi-user operation can take the full-sized, tower-mount IT.

It's a shame the Micro IT doesn't have a micro price — if it did have, it would be my unquestioned first choice in a desktop because of its convenient *and* attractive package size.

Power AT Work!

Down to the business we love best — performance! The four machines had just what we wanted, as our performance tests quickly proved.

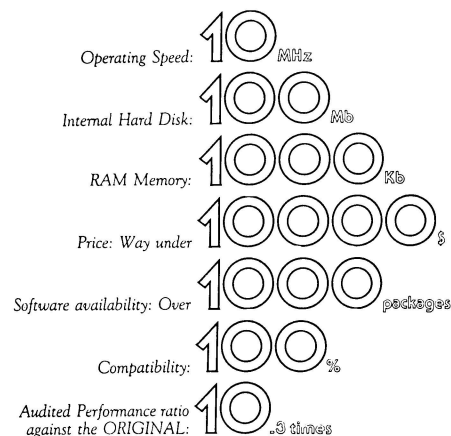
We've carried full descriptions of the tests themselves several times (the September issue was the last — and we'll probably do so again next time around),

so we'll simply give you an abbreviated rundown here —

We ran each of these machines through a series of nine tests designed to give a measure of overall performance in the everyday work situation — claims based on straight processor speed are often decidedly misleading because they take no account of other important factors, such as disk performance. You can see from our 'percentage of IBM' comparison chart that many machines with very high processor ratings drop back when overall performance is measured.

Only three of our tests, BBBMARK (a simple Microsoft BASIC loop), CBSIEVE (the Sieve of Eratosthenes in compiled CBASIC), and the Lotus recalculation are direct measures of processor speed.

The Lotus tests measure the time taken to load, recalculate and save a large (but simple) spreadsheet, while the dBase tests measure the time taken to create a ▶



Keller Automation call its machine 'The Perfect 10' and describes it with this great-looking promotional sheet.

AT Speed!

file from calculated fields, index it, and partially delete/pack the file.

DOIT measures floppy to hard disk transfer speed, and is used to load the other test software onto the machines to start with.

Five tests are disk intensive — the Lotus load and save, stage two and three of the dBase benchmark, and DOIT — and usually show up some interesting differences between machines.

ATtesting, ATtesting . . .

So how did our latest stars perform? Let's take them for a spin . . .

DOIT: This measure of floppy-to-hard-disk transfer speed is usually a great leveller, but it couldn't level the Video Technology and Micro 10 machines.

The VT-AT ran a blinding 33.5 seconds, by far the best time we've ever recorded. The Micro 10 wasn't far behind at 42.3 (the third-best we've seen), while the Osborne and the Sperry turned in a 'more normal' 60.5 and 65.2 seconds respectively.

Score one — the first of many — for the locally assembled Video Technology AT.

BBBMARK: There was very little in it — in fact, the differences are academic, as all the machines logged times obviously in the hot-rod 10 MHz category.

The VT clocked a punchy 5.3 seconds,

but was matched to the tenth by the Osborne SP. Just behind them, at 5.5 and 5.6 respectively, were the Micro 10 and the Sperry.

Only the 12.5 MHz ECS which starred last month could keep them from the top of the table.

Cbsieve: This processor-only test occasionally throws us a few surprises — we would suspect timing errors on our part if not for the fact we run it 10 times as long and then divide the result .

The scores are on the board, however, and they show the Sperry is a champion — it won this one with 2.7 seconds, ahead of identical times of 2.9 for the other three. Little David was looking happy to mix it with the three Goliaths . . .

Lotus Load: We love the clunk of a voice-coil drive in the morning! Score another for the Video Technology machine, which ran through this one in 18 seconds neat.

It was a clear win, ahead of 20.2 for the Micro 10, 22.5 for the Osborne, and 23.6 for the Sperry. You'll see from the performance chart that it's rare for a machine to stand out on this one — almost all the machines tested so far have hovered between 22 and 24 seconds.

Lotus Recalculation: Osborne gets back into the action in a hair-splitting result — 4.4 seconds to the Video Technology's 4.5.



The Perfect 10 from Keller Automation — another surprise packet (and with special features!)

The others weren't hanging about, either, with 4.6 for the Sperry and 4.7 for the Micro 10. Whhooosh!

Lotus Save: Another great equaliser, and all our contenders were up to the challenge — beating the former kings, the ITT and the Archives Micro Five (no, no relation to the Micro 10). Incidentally, we are intentionally leaving the Earth Computer Systems machine alone in these discussions of 'past champions' — it is so far ahead we'd sound like a broken record.

The top-scorer this time was the Sperry on 12.3 seconds, from the Osborne at 12.4, the VT at 12.7 and the Micro 10 at 12.9.

dBase Bmark: The first, compute-bound stage of this three-stage benchmark was incredibly close — after almost four minutes of number-crunching just four seconds separated the machines.

The VT came up trumps again at 220 seconds, followed at one-second intervals by the Sperry, the Osborne and Keller's Micro 10.

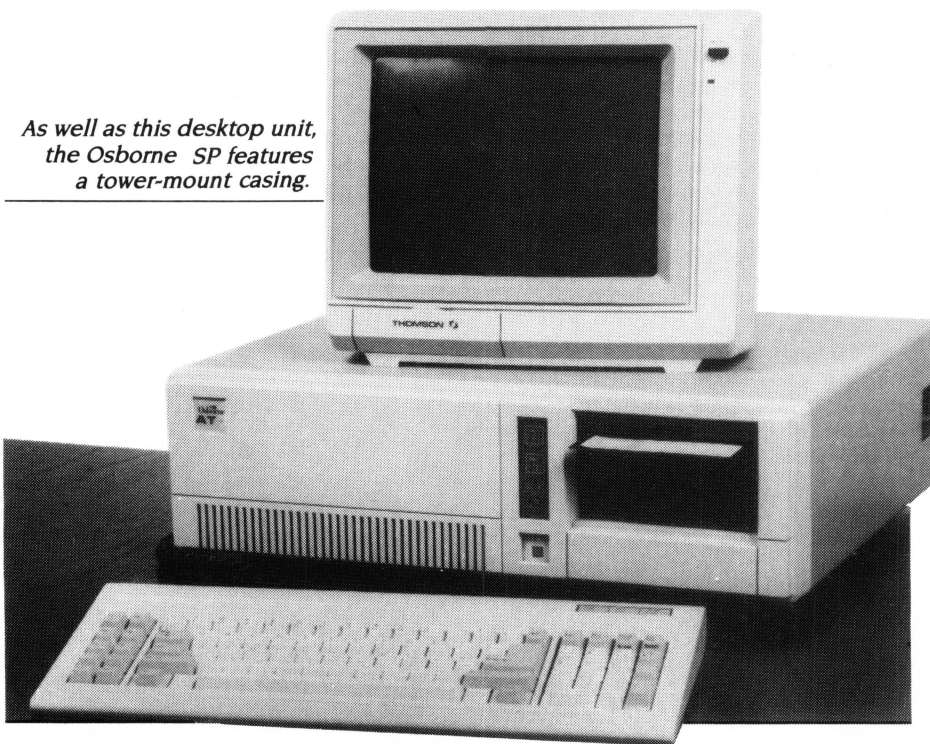
The story changed a little — both in order and in the size of the margins — on the disk-intensive second and third stages.

On stage two Video Technology waltzed away with 249 seconds, ahead of the Micro 10 on 294, the Osborne on 297 and the Sperry on 336.

Stage three saw a similar result: the VT out front on 276 seconds, a close battle for second going to the Micro 10 on 329 seconds from Osborne's 334, and the Sperry bringing up the rear with 367 seconds.

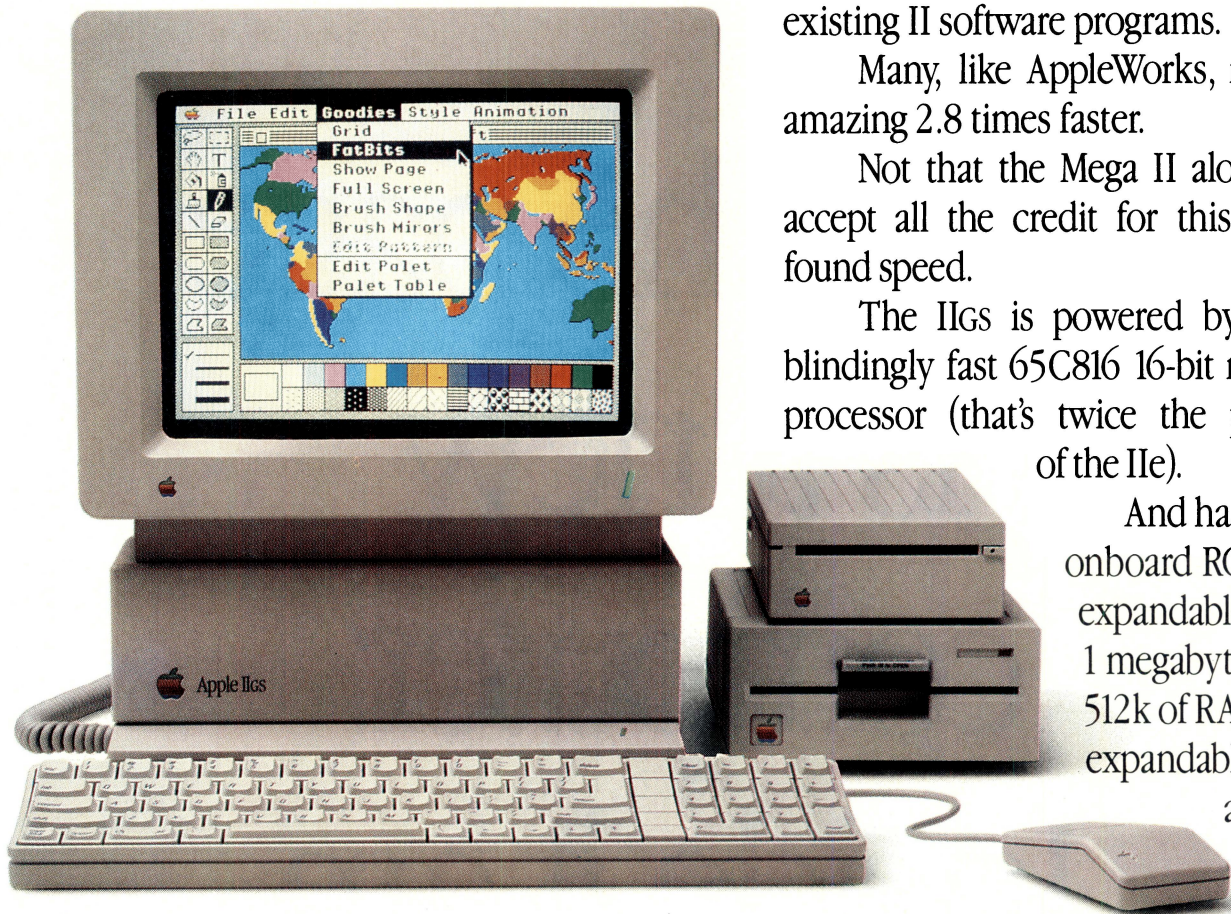
Overall performance? The Video Technology machine was unbeatable, moving into second place on our chart of all the ▶

As well as this desktop unit, the Osborne SP features a tower-mount casing.



Over the page
is a new
computer.
Inside it are
two more.

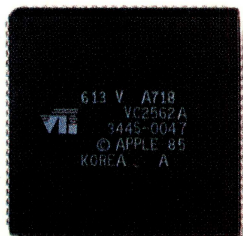
The new Apple IIgs.



The new Apple IIgs features among other things, a built-in Apple IIe and IIc.

Both of these computers, or rather, their functions, have been built into the Mega II chip you see here (and that's its actual size, of course).

Two years in the making, you'll find the revolutionary Apple Mega II microchip alongside many other new custom chips on the IIgs motherboard.



We put it there for one simple reason.

Compatibility.

The IIgs runs virtually all of the 10,000

existing II software programs.

Many, like AppleWorks, run an amazing 2.8 times faster.

Not that the Mega II alone can accept all the credit for this new-found speed.

The IIgs is powered by a new, blindingly fast 65C816 16-bit microprocessor (that's twice the power of the IIe).

And has 128k of onboard ROM that's expandable to 1 megabyte. Plus 512k of RAM, expandable to

a massive 8 megabytes.

Which means you can run the most advanced software without running out of memory.

The IIgs was partly named after its graphics, and no wonder.

The IIgs can create graphics as clear and sharp as the photographs you see in this magazine.

But with one major difference.

The range of colours.

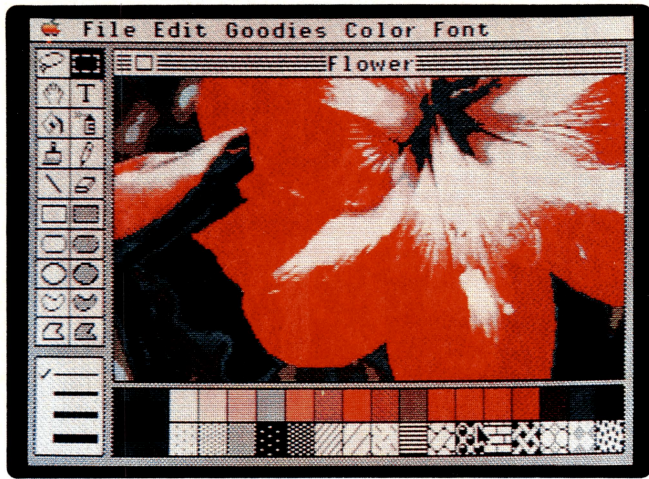
The IIgs has 4,096 in all. From delicate violet to electric red.

Any 256 can be used at a time in either of two graphic modes: 640 × 200 dots or 320 × 200 dots.

But you haven't heard anything yet.
And we mean that literally.

The IIGS is so human, it even speaks.

The secret is a 32 channel Ensoniq sound chip, the kind you find in \$40,000



sound synthesizers (who says Apples aren't value for money?).

It allows you to compose for and play up to 15 instruments at a time.

(Now you know where the other half of its name comes from.)

Naturally, with such high-fidelity sound, it makes sense to add the optional Bose RoomMate hi-fi speakers.

It also made sense to redesign the IIG keyboard to give you maximum freedom.

This one is detached, so you can move it all over your desk.

Or hold it in your lap.

And to make number crunching easier, there's a numeric keypad built in.

The Mouse, now standard, can be attached to either side of the keyboard.

(We didn't want to make left-handers feel left out.)

Also standard on the IIGS is MouseDesk. The software program that gives the IIGS its Macintosh-like interface.

So now, transferring ideas into action is as easy as clicking a button.

And while the IIGS is easy to use, it's just as easy to expand.

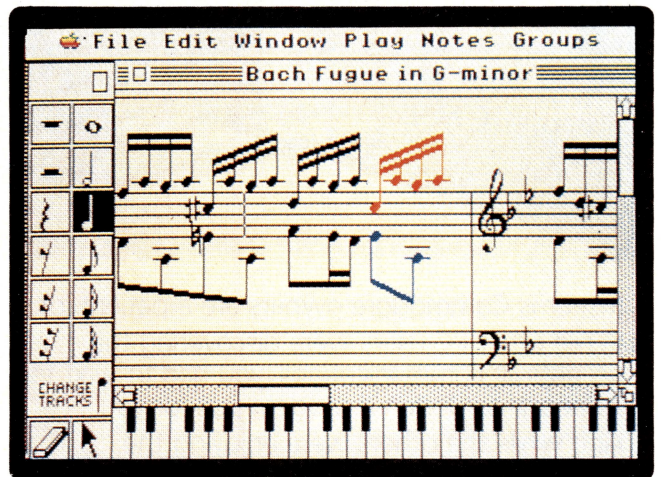
There are eight expansion ports at the back of the machine where you can plug in peripherals.

Anything from disk drives to modems, joysticks to printers.

You can share a LaserWriter with up to 30 other computers, thanks to AppleTalk, built into every IIGS.

Not only can you plug in a cord, you can plug in a card.

Take off the top of the IIGS and you'll find eight expansion slots where once again



it's easy to make the IIGS smarter, faster or more powerful.

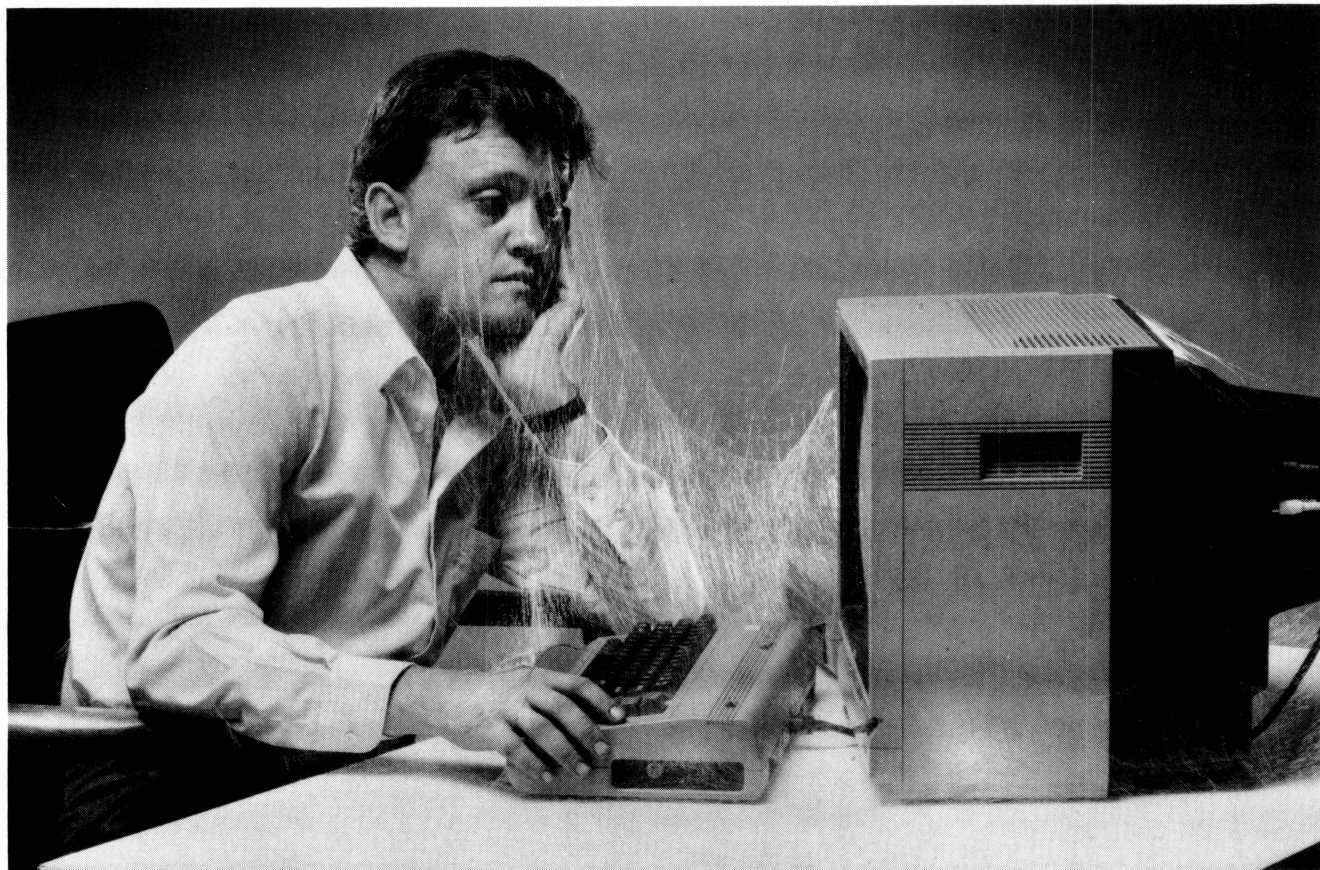
As improvements become available, you'll also be able to plug them in. So your IIGS will never become obsolete.

The new Apple IIGS.

It's even greater than the two computers inside it.



NetComm believes Commodore owners have waited long enough.



It seems Commodore owners are a patient lot. While other PC users were discovering the delights of communications, you had to wait for someone to design a modem just for you.

And while the others were enjoying the convenience of auto dial and auto answer, you were left waiting again.

But now, with the introduction of NetComm's Modem 64/128 for Commodore, your wait is over.

The Modem 64/128 is a full-feature, two-speed auto modem compatible with all existing commercial and public domain software, including Commodore 1650 software.

It operates at 300/300, 1200/75 and 75/1200 baud.

It comes complete with Videotex and Terminal software and even a VIATEL subscription form.

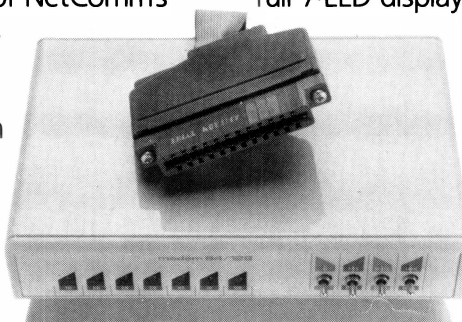
It provides auto dial, auto answer and auto disconnect features you'd only expect to find on much more expensive modems.

All modem features are software controlled, with a full 7-LED display reporting all operational modes.

And it comes complete, with Telecom approval, ready to plug in and run.

All this, plus NetComm's legendary reliability, for less than \$300, excluding tax.

So now, what are you waiting for?



NetComm

Total Solutions for Data Communications

NetComm (Aust) Pty Ltd • NSW PO Box 284 Pymble NSW 2073 Tel: (02) 888 5533 Telex: AA27488 MODEMS Minerva: 07:DNC002 Viatel: 288855330
VICTORIA 94 River Street South Yarra 3141 Tel: (03) 241 0534 **QUEENSLAND** Suite 6 Level 11 AMP Place 10 Eagle Street Brisbane 4000 Tel: (07) 229 7376

AT Speed!

Machines tested so far, but the others were close behind.

The Osborne and the Micro 10 had an incredible tussle for number two in this test — only the big difference in the floppy-to-hard-disk transfer test toppled it in the Micro 10's favour.

The little Sperry came in last, but still sits proud in the top section of our all-machines table. It's a giant-bruiser...

EmmachisAT?

Now we get to the juicy bit. The Video Technology and the Osborne just don't deserve to be this fast at their price. I think I see yet another new rule book being written in the near future.

The Osborne starts life at \$3750, tax paid and including mono monitor but without hard disk. If you want to get going quickly and cheaply you can have a 20 Mbyte standard drive for \$1320 for an all-up, ready-to-run price of just on \$5000.

But if you want the performance we've seen here, you need the 44 Mbyte Mini-scribe at \$2310 — which still gives you stunning value at \$6000 for one of the hot-test machines in town.

The Video Technology unit is a little faster, and costs a little more — but given the quality and the extras like four serial ports and two years' warranty, its \$7300 tax-included retail price is top value.

The Micro 10 we tested weighs in at \$13,500, but was a top-of-the-line version with a 72 Mbyte voice-coil hard disk. Starting price in the Micro 10 range is \$6198 for the base unit.

The Sperry starts out at \$6470, but by the time you add its high-resolution graphics card and appropriate professional-quality monitor (\$3000) and then apply sales tax you're looking on the high side of \$11,000 — it's worth the money, but is certainly not in the bargain class of the Osborne or the Video Technology.

WhATwun For Me?

If you've been following this series, I suppose you've realised by now that I am one of the most fickle people you've seen — every time we run a comparison I jump on a new bandwagon, or so it seems.

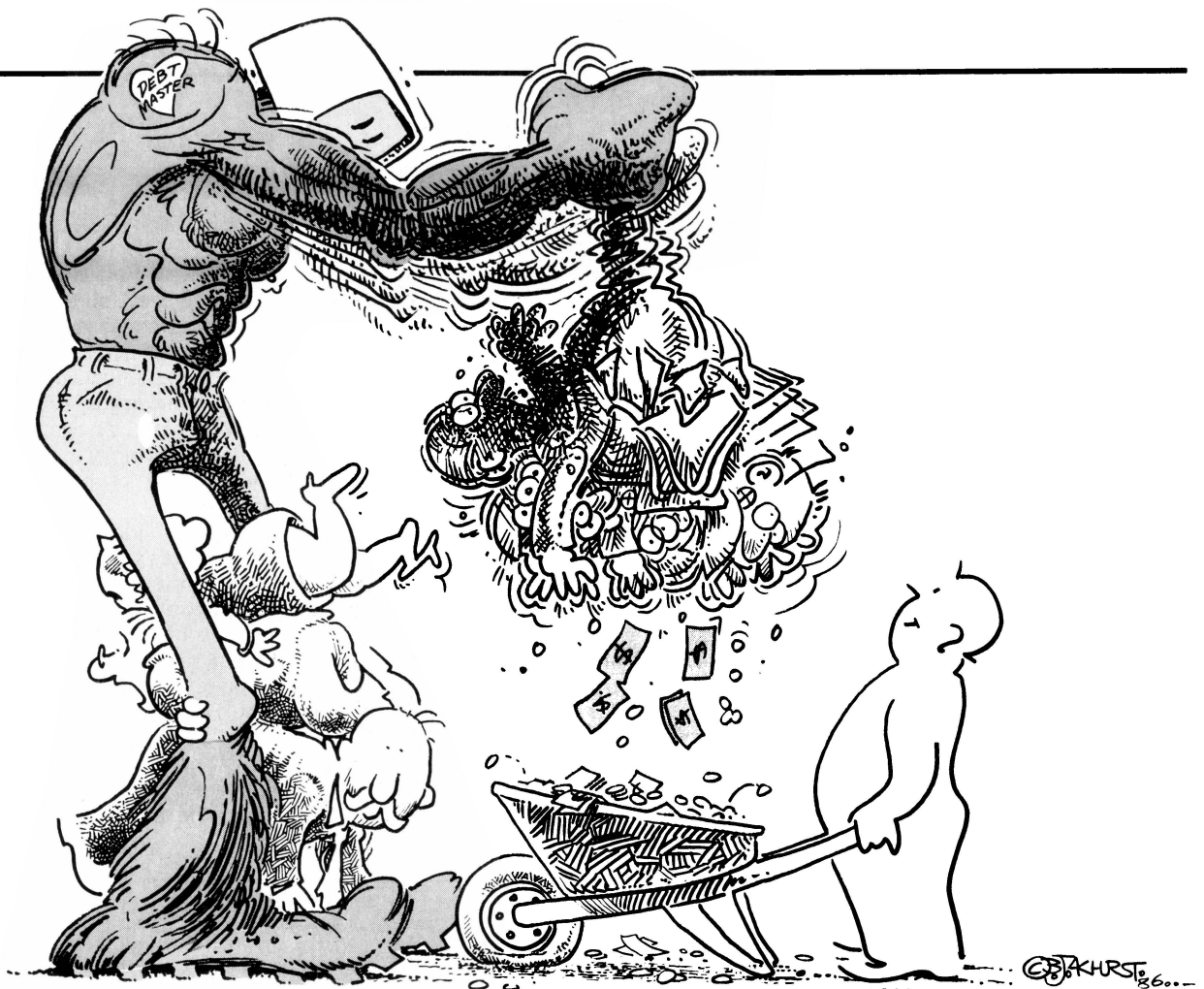
Well, here I go again. Today I want the Video Technology machine for its wonderful balance of performance, price and quality.

But my budget-conscious side says Osborne, which provides the zip (let's face it, what I'm looking for is a one-dollar Cray) at a decidedly attractive price.

Of course, the Sperry would look good on my desk, I still like the zoom-for-the-money of the Dick Smith Multitech and the Hypec Lingo, the balanced value of the Televideo, the...

Oh, hell, I'd enjoy almost every machine on the list. Let's settle this the simple way: the first company to give me one wins! □

	BBBMARK	CBSIEVE	Load	Lotus Recalc	Save	dBase II		Stage 3	DOIT	Issue Tested
						Stage 1	Stage 2			
ECS 12.5 MHz	3.7	1.75	12.4	3.0	11.7	144	209	228	54.0	November 1986
Video Technology	5.3	2.9	18.0	4.5	12.7	220	249	276	33.5	December 1986
ITT Xtra XL	5.5	2.65	16.5	4.4	13.0	238	267	298	50.0	September 1986
Micro 10	5.5	2.9	20.2	4.7	12.9	223	294	329	42.3	December 1986
Osborne SP	5.3	2.9	22.5	4.4	12.4	222	297	334	60.5	December 1986
Sperry Micro IT	5.6	2.7	23.6	4.6	12.3	221	336	367	65.2	December 1986
MicroFive	5.6	2.89	22.0	4.9	12.9	294	258	353	66.2	May 1986
DSE Multitech	5.5	2.93	22.8	4.5	24.4	224	322	359	64.4	November 1986
NEC APC IV	6.9	3.68	22.5	5.5	13.0	280	331	372	42.7	November 1986
Hypec Lingo AT	6.9	3.69	23.0	5.8	13.0	280	326	366	69.0	September 1986
Televideo Telecat	6.9	3.70	22.2	5.8	13.5	281	366	403	55.0	September 1986
NCR PC8	7.0	3.70	23.3	6.0	14.0	280	315	351	68.0*	January 1986
Sanyo MBC 990	7.5	3.63	23.2	5.9	15.5	303	378	422	40.5	November 1986
TI Turbo	7.3	3.64	23.4	6.0	14.4	307	391	435	46.0	January 1986
Compaq 8 MHz	6.9	3.69	22.5	5.5	13.8	281	434	476	62.3	January 1986
President AT	6.9	3.56	23.5	6.0	14.1	306	382	425	85.5	May 1986
HP Vectra	6.9	3.69	23.2	5.5	23.0	283	472	514	70.0	May 1986
Sperry PC/IT	6.9	3.71	22.8	5.8	25.1	287	393	573	71.3	May 1986
Ferranti PC2860-AT	7.0	3.71	23.5	6.0	24.2	284	458	501	67.0	November 1986
IBM AT	9.1	4.89	23.8	7.7	23.3	378	408	458	57.0	January 1986
Kaypro 286i	9.1	4.89	23.5	7.7	23.5	379	403	452	77.3	January 1986



DEBTMASTER — Part 2

In this instalment of the ultimate debt-recovery program, Lindsay Ford tells you how to enter a debtor onto file. We can almost guarantee your debtors are experiencing 'hairs prickling on the back of the neck'.

In Part I, I described the Debtmaster menu program. If you have it up and running you'll be able to change the system date, enter a debt-recovery base and exit from the system. In this part we'll cover the sub-program which lets you put a debtor on file or change the details of an existing debtor (Menu keys N and C). Name the sub-program NEW.MWB and use the rules for program entry described in Part I.

Entering a Debtor

When you press N from the Menu this program runs, the date is displayed and the screen fills with prompts for the various items of data that make up a debtor entry (see Figure 1). Make sure the DATE is cor-

```

First letter of NAME: S           Date 14/12/86
Debtor's NAME:      MR. JOHN SMITH*****
Debtor's ADDRESS:   44 JONES ST.,*****
                   BULLAMAKANKY 4130*****
                   *****
Re:                 CONCRETING: PAVING & PATIO AT*
                   YOUR HOME*****
Reference:          AJC 86-414**
Amount:             1200*****
Star Characters (*) indicate unused characters in data field
  
```

Figure 1. Sample screen layout to enter data for a new account.

```

00001 REM ----- NEW -----
00002 POKE 140,1: GOSUB 73: CURS 0: CLEAR: STRS(20000):
    DIM A$(250),A1(250),A2(10): REM Set up arrays
00003 FOR X=1 TO 10: A2$(X)="": NEXT X: REM A2$ a string array
00004 OPEN "I",6,"DATE.DBT": IN#6ON: OUT#0: OUT#0OFF:
    INPUT K3$,K4$,M,D,U: IN#0: OUT#0: CLOSE 6: REM Get date file
00005 E=M: A2$(1)="0": A2$(2)=K3$: W=1: REM W=1 if NEW, 0 if CHANGE
  
```

Taking Care of Business

rect (press RETURN to exit if not), then enter the data as follows:

First letter of NAME: This identifies the disk file in which the debtor entry is to be stored. Use the first letter of the surname, otherwise the account may be hard to find when you need it.

If a disk file (S.DBT in our example) already exists, it will be loaded into memory and the program will warn you if it is full. This is unlikely unless your business is very large or you haven't bothered to Write-Off or Summons old overdue bills, as each file can hold 250 accounts (to a maximum of 18 Kbytes of memory). If you do happen to fill a file, it's better to start a new Debtmaster disk than to store the debtor on another disk file.

Debtor's NAME: Enter the name the way it is to appear on the bill. Make sure the spelling is correct — Mr Smith's account may be a little hard to track down if you enter him as 'Mr Smth'.

Debtor's ADDRESS: Three lines should be ample for all but the most unusual addresses. Don't forget the postcode.

Re: This is important to allow the customer to identify the account you're talking about and so you can analyse your performance in various areas of business. Work out different short words or codes to describe the different types of work you do or goods sold (concreting, landscaping, or whatever), then enter this first, followed by a colon. If you follow this practice with all accounts, you can use the Search program (Part 5 of this series) to do a printout of all entries for the specific types of work and the total earnings (or outstanding) from it.

Note the colon after the work description is not essential. It limits the amount of text that will go into the Paid Bills Ledger (in our example only 'Concreting' would appear), resulting in a tidier appearance than if the text appears in full).

Reference: This field is optional (press RETURN if not required). It's designed to allow you to enter the invoice number, but it's also a good idea if you have more than one person in your business to enter their initials so Search can check on their performance. Use three initials to avoid confusion (for example, if I use LF to identify my accounts, then Search will also turn up words such as 'Caulfield' or 'Alfred'). The problem is avoided if I use LRF.

Amount: Enter the amount owing. There is no need to enter trailing zeroes (for exam-

```
000006 IF U>999 THEN LET U=U-1000: W=0: GOTO 6: REM Reset U
```

```
*** MAIN INPUT ROUTINE ***
```

```
000007 K5$="": GOSUB 65
```

```
000008 CURS 22,16: PRINT "Press <RETURN> to Abort";
```

```
FILENAME INPUT
```

```
000009 CURS 26,5: PRINT " "; GOSUB 60: IF X=13 THEN 50 ELSE IF X<65  
OR X>90 THEN 9 ELSE CURS 27,5: K5$=CHR(X): PRINT K5$: P=X  
000100 GOSUB 74: ON ERROR GOTO 11: C=0: OPEN "I",6,CHR(P)+".DBT":  
IN#60N: OUT#0: OUT#0OFF: INPUT C: FOR X=1 TO C:  
INPUT A0$(X),A1$(X): NEXT X: REM Load the File (if any)  
000110 ON ERROR GOTO 0: IN#0: OUT#0: CLOSE 6: N=C+1: K0$="FILE": IF  
W=1 THEN 21: REM Skip next routine if NEW  
000120 IF C>0 THEN 14 ELSE GOSUB 73: CURS 22,16: PRINT  
"<<< CAN'T FIND "; K0$: " >>>"; REM Error if no such file  
000130 CURS 0: FOR X=1 TO 10: A2$(X)="": NEXT X: PLAY 22,1: 0,10:  
GOTO 7: REM Clear account data array and start again
```

If "CHANGE" then find account to be altered. If found then account will be in A1\$(J). C=Number of accounts in file.

```
000140 GOSUB 73: PRINT "Enter a few letters of debtor's name ";  
[A16 42];  
000150 G=0: L=16: S=30: V=16: GOSUB 54: IF K0$="" THEN 7: REM Get  
name input. Abort if <RETURN>  
000160 GOSUB 74: FOR Z=1 TO C: K1$=A1$(Z): REM Look for name  
000170 FOR X=1 TO 10: J=SEARCH(K1$,CHR(124)): A2$(X)=K1$(J-1):  
K1$=K1$(J+1): NEXT X: IF SEARCH(A2$(3),K0$)=0 THEN 20  
000180 GOSUB 65: N=2: E=INT(A0$(Z)): GOSUB 73:  
PRINT "Is this the one (Y/N)? "; CHR(8): REM Print any  
account that seems to match  
000190 GOSUB 62: IF X=89 THEN NEXT*Z 21 ELSE IF X=78 THEN  
GOSUB 74 ELSE 19: REM Continue if "N" (X=78)  
000200 F0=FRE(0): NEXT Z: C=0: K0$="NAME": GOTO 12: REM Error if  
can't find account. FRE(0) is only for crash protection.
```

```
TEXT ENTRY
```

```
000210 GOSUB 73: F0=FRE(0): IF (C=250 OR F0<2000) AND W=1 THEN  
CURS 25,16: PRINT "<<< FILE FULL >>>"; GOTO 13: REM Don't  
allow a NEW account if file full  
000220 GOSUB 73: CURS 20,16: PRINT "Press <RETURN> for new line";
```

```
Debtor's Name
```

```
000230 C=C+W: G=0: L=30: S=27: V=6: GOSUB 54: IF K0$<>"" THEN 24  
ELSE IF W=0 THEN 25 ELSE 2  
000240 IF K0$="" THEN 53 ELSE IF ASC(K0$(1LEN(K0$)))<47 THEN LET  
K0$=K0$(1,LEN(K0$)-1): GOTO 24 ELSE LET A2$(3)=K0$:  
IF W=0 THEN GOSUB 65: REM Don't allow punctuation at end  
of name string
```

```
Debtor's address
```

```
000250 G=W: FOR V=7 TO 9: GOSUB 54: G=0: IF K0$="" THEN 26 ELSE LET  
A2$(V-3)=K0$: IF W=0 THEN GOSUB 65
```

```
Re
```

```
000260 NEXT V: G=W: FOR V=10 TO 11: GOSUB 54: G=0: IF K0$="" THEN 27  
ELSE LET A2$(V-3)=K0$: IF W=0 THEN GOSUB 65
```

```
Reference
```

```
000270 NEXT V: L=12: V=12: GOSUB 54: IF K0$="" THEN 28 ELSE LET  
A2$(9)=K0$: IF W=0 THEN GOSUB 65
```

```
Amount
```



Taking Care of Business

ple, you can enter \$500.00 as 500, \$61.50 as 61.5, and so on). Note you can't enter an amount over \$999,999.99. If you're dealing in invoices that big, you can afford to hire an accountant.

When the account is entered you will be asked if you want to "Allow this client extra time to first reminder?" This lets you permit the customer to exceed your account terms, and if you answer Y, you will be asked to enter a figure of from 1 to 9 weeks. If, for example, the first reminder is set to go out in 30 days and you use this facility to give a customer an extra four weeks, a reminder letter won't be sent to him or her until 58 days have passed.

This completes the data entries required to put an account onto the system. You will now be given from two to four options:

Key M — This stores the entry and takes you back to the main menu.

Key N — This lets you enter another account. It is not included if you've set the date access switch in the base to allow entry of accounts of varying dates.

Key R — Use this if you've made a mistake. The entry is ignored and you can type it out again.

Key T — This is only available if the TYP program (Part 6 of this series) is on the disk. It allows you to type out the customer invoice.

Changing a Debtor Entry

This option (Menu key C) lets you change the details, other than the actual account date or the file on which the account is stored (in these cases the account must be cancelled and re-entered), of an existing debtor. It is useful when a debtor changes address, or if you've made a typing mistake which you didn't notice when you entered the account. Don't use it to change the amount owing if a part-payment is made — part-payments and cancellation of accounts are covered in Part 3.

The screen prompts are as in the NEW DEBTOR option. Enter the first letter of the debtor's name (as for a NEW account) and the file will be loaded. An error message will occur if no such file exists, and you will have the option of trying a different letter or of returning to the Menu (the correct file can be found with the Search facility detailed in Part 5).

Once the file is loaded, the program will ask you to enter the first few letters of the debtor's name. In our example in Figure 1, you could type SM, SMITH or even JOHN.

```
00028 G=W: L=9: V=13: GOSUB 54: IF K0$="" AND W=0 THEN 33
00029 F0=VAL(K0$): K0$=STR(F0): K0$=K0$(12): X=SEARCH(K0$,"."):
    IF X>0 AND LEN(K0$)>X+2 THEN LET K0$=K0$(1,X+2): REM Convert
    input to correct string format
00030 IF X>LEN(K0$)-2 THEN LET K0$=K0$+"0": GOTO 30: REM Add
    trailing zeroes
00031 CURS 27,13: PRINT [A9 42]: IF F0<0.01 OR F0=>1000000 THEN 28:
    REM Don't allow illegal values
00032 A2$(10)=K0$: GOSUB 65
```

If CHANGE then allow user to re-set time period on account

```
00033 T=0: IF W>0 THEN 36 ELSE GOSUB 73:
    PRINT "Re-start reminder time period (Y/N)? *": CHR(8)
00034 GOSUB 62: IF X=89 THEN LET E=M: A2$(1)="" ELSE
    IF X<78 THEN 33
00035 GOTO 42
```

If NEW then allow user to set extra time to first reminder

```
00036 GOSUB 73: PRINT "Allow this client extra time to first
    reminder (Y/N)? *": CHR(8)
00037 GOSUB 62: IF X=78 THEN 42 ELSE IF X<89 THEN 37
00038 GOSUB 73: PRINT "How many weeks (1-9)? *": CHR(8)
00039 GOSUB 62: X=X-48: IF X<1 OR X>9 THEN 39
00040 T=X: GOSUB 73: PRINT "Extra time of": T: " weeks (Y/N)? *":
    CHR(8)
00041 GOSUB 62: IF X=78 THEN 36 ELSE IF X=89 THEN LET T=T*7 ELSE 41:
    REM Convert input into number of days
```

Assemble account string and date variable

```
00042 A0(N)=FLT(E+T): K0$="": FOR X=1 TO 10: K0$=K0$+A2$(X)+CHR(124):
    NEXT X
```

ENTRY COMPLETE: Find out what user wants to do now

```
00043 A1$(N)=K0$(1,LEN(K0$)-1): K0$="": Z=0: IF W=0 THEN 45 ELSE
    IF D<2 THEN LET K0$=<N>=Next entry ": REM If NEW then allow
    user to proceed to make another entry
00044 ON ERROR GOTO 45: OPEN "I",6,"TYP.MWB": Z=1:
    K0$=K0$+<T>=Type ": REM If NEW and TYP.MWB is on disk then
    allow user to type out account
00045 ON ERROR GOTO 0: CLOSE 6: GOSUB 73: PRINT "PRESS: <R>=Re-do ":
    K0$: "<M>=Menu *": CHR(8)
```

```
00046 GOSUB 62: IF X=82 THEN 2 ELSE IF D<2 AND X=78 OR X=77 THEN 48:
    REM If key "R" then ignore entry and start again. If Date
    access flag set then return to Menu
00047 IF Z=0 OR X>84 THEN 46: REM If "T" then type
```

Save file with new (or changed) entry

```
00048 GOSUB 73: CURS 26,16: PRINT "-Saving File-": CURS 0
00049 OPEN "O",6,CHR(P)+".DBT": OUT#6: PRINT C: FOR Y=1 TO C:
    PRINT A0(Y): ", '": A1$(Y): "'": NEXT Y: OUT#0: CLOSE 6
```

Save Date file

```
00050 GOSUB 74: OPEN "O",6,"DATE.DBT": OUT#6: PRINT "'": K3$
    "'": K4$: "'": M: ",": D: ",": U: OUT#0: CLOSE 6
00051 GOSUB 73: CURS 0: IF X=78 THEN 2: REM loop if "N"
```

If user wants to "Type" then save account in a temporary file and run TYP program

```
00052 IF X=84 THEN OPEN "O",6,"TEMP.***": OUT#6: FOR X=1 TO 10:
    PRINT "'": A2$(X): "'": NEXT X: OUT#0: CLOSE 6: RUN "TYP"
```

```
00053 CURS 0: RUN "DEBT"
```

MISCELLANEOUS ROUTINES & SUBROUTINES



**NEW
VERSION
4**

**MICROSOFT
"C"**

COMPILER

Develop high performance programs with Microsoft C Compiler.

- Generate fast, compact native code with Microsoft C Compiler. Features like register variables, granular run time libraries, and automatic optimization help you produce compact executable files.
- Design programs that make effective use of the available memory of your computer. You can write small, medium, compact, large or huge memory model programs. And you can create mixed model programs using the near and far pointers.
- Link your C routines with routines written in Microsoft FORTRAN, Microsoft Pascal, or Microsoft Macro Assembler. Mix different languages together to utilize the best features of each.

Take advantage of Microsoft Code View, a revolutionary graphic source-level window oriented debugger

- Control the way your program executes while you're debugging. Trace execution, set break-points, set and watch variables, trace and modify the stack.
- View source and disassembly code at the same time. See data automatically updated as variables, registers, and flags are displayed.
- Speed debugging with Microsoft Code View's highly visual, easy to use interface. Utilize colour, pull-down menus, an optional mouse, and up to four windows.

Work with a complete C development environment.

- Use Microsoft C Compiler's full implementation of UNIX System V libraries, three math libraries, a linker, a library manager, and a program maintenance (MAKE) utility.
- Take advantage of the ability to transport your source and object code between MS-DOS and XENIX® operating systems.

\$780

NEW!

TURBO ASYNC PLUS

Communications for Turbo Pascal.

\$245

NEW

SMALLTALK 5

Explore AI on your PC!

- High performance object-oriented programming
- Integrates object-based and rule-based programming with object-oriented Prolog
- A user-extensible, open-ended environment
- A responsive graphical user interface
- Supports exploratory programming and prototyping
- Class hierarchy with inheritance creates highly re-useable code.
- Smalltalk source code included, with browser windows for easy access and modification.
- A huge tool kit of classes and object for building a variety of applications.
- Object-swapping creates virtual memory on hard disk or RAM disk.
- Bit-mapped graphics with bit and form editors.
- A sophisticated source-level debugger.
- Automatic change log for easy recovery from errors.
- Powerful directory/file browser system for organizing DOS files.
- Optional communications interface to UNIX and other systems.
- Access to other languages and DOS functions.
- DOS command shell.
- Detailed owner's manual designed for both beginners and advanced programmers.
- Not copy protected.

\$245

**SOFTWARE
Express**

48 A'Beckett St, MELBOURNE 3000

Phone (03) 663 6580

Mail Orders Welcome

NEW

Why "BRIEF" is the BEST Program Editor!

BRIEF offers the features MOST ASKED FOR by professional programmers. In fact, BRIEF has just about every feature you've ever seen or imagined, including the ability to configure windows, keyboard assignments, and commands to YOUR preference.

Every Feature You Can Imagine....

Compare these features with your editor (or any other for that matter).

- Fast
- Full UNDO (N Times)
- Edit Multiple Large Files
- Compiler-specific support, like auto indent, syntax check, compile within BRIEF, and template editing
- Exit to DOS inside BRIEF
- Uses all Available Memory
- Tutorial
- Repeat Keystroke Sequences
- 15 Minute Learning Time
- Windows (Tiled and Pop-Up)
- Unlimited File Size - (even 2 Meg!)
- Reconfigurable Keyboard
- Context Sensitive Help
- Search for "regular expressions"
- Mnemonic Key Assignments
- Horizontal Scrolling
- Comprehensive Error Recovery
- A Complete Compiled Programmable and Readable Macro Language
- EGA and Large Display Support
- Adjustable line length up to 512

The Experts Agree....

Reviewers at BYTE, INFO WORLD, DATA BASED ADVISOR, and Dr. DOBB'S JOURNAL all came to the same conclusion - BRIEF IS BEST!

\$410

(Not copy protected)



NEW!

TURBO POWER TOOLS PLUS

Utilities for Turbo Pascal

\$245

KEEP YOUR EGGS IN THE SAFEST BASKET!

TANDON DRIVES

TM 262 –

With an ordinary disk drive even a slight bump can be a disaster, damaging the head and resulting in catastrophic loss of precious data – and time. But not with the TANDON 262! The unique non-crash head, shock mountings and low inertia can withstand as much as 40G of impact, even during access, and that's –

THE PROTECTION YOU NEED!

TM 755 –

This is the disk drive that proves that small and fast is beautiful. The Tandon TM 755 gives you 51M with rapid access and whisper quiet operation in a half height package.

As with all products from Micro General, our highly compact disk drives assure you of reliability and value for money.

MICRO • GENERAL



For the name of your nearest Dealer, call us today:

Micro General Pty Ltd

(Incorporated in NSW)

115 Church Street,
Camperdown NSW 2050
Telephone: (02) 550 2333

Taking Care of Business

The program will then search the file for the letters you entered and will give an error message if the sequence isn't found. If a matching entry is found it will be displayed exactly as it was when you first entered it (that is, as in Figure 1), and you will be asked if this is the account you want. If you reply N, the program will continue its search.

Once the correct account is located, the cursor will be positioned under the first letter of the Debtor's NAME. If the change you want to make is in this line, type it out again and press RETURN when you've finished. The program doesn't let you type only part of the entry, thus if the account in our example was really meant to go to Mrs Smith and you simply type 'Mrs' RETURN that's what the name will consist of — 'Mrs'. This shouldn't be a problem, as data entries are quite short (they have a maximum of 30 characters).

If you don't want to change a particular line, press RETURN and the cursor will drop to the line below. Once you've made the required alteration/s (if any) the new text will be displayed and the program will ask if you want to re-start the time period for reminders. This lets you start again if you've been sending accounts and reminders to an incorrect address.

You will now be asked if you want to return to the menu (Key M) or re-do (that is, retype the account — Key R).

Next Time

Once you've entered the NEW program you'll be able to start putting accounts onto the system. In Part 3 we'll cover how to mark accounts paid, only part-paid, cancelled, written off or referred for legal action. ☐

Text Input Subroutine:

S=Horizontal Position for start, H=Current Horizontal position, V=Vertical position, G allows null entry if =0, L=Maximum string length permitted, K0%=Input String

```
00054 H=S: K0%="": CURS H-1,V: PRINT " "; REM Display Cursor at
start of appropriate line
00055 GOSUB 62: IF (G=0 OR H>27) AND X=13 THEN RETURN ELSE IF X=13
THEN 55: REM Implement <RETURN> key
00056 IF X<>8 AND X<>127 THEN 58 ELSE IF H>S THEN CURS H,V: PRINT
CHR(8); "*"; CHR(8); H=H-1: K0%=K0%+(1,LEN(K0%)-1) ELSE
CURS H-1,V: PRINT " "; REM Implement <DEL> & <BACKSPACE>
00057 GOTO 55
00058 CURS H,V: PRINT CHR(X); H=H+1: K0%=K0%+CHR(X): IF LEN(K0%)<L
THEN 55: REM Add key pressed to string and continue if string
not too long
00059 RETURN

00060 GOSUB 62: REM Get key in K0%
00061 K0%=CHR(X): RETURN
```

Get key subroutine

```
00062 X=ASC(KEY$): REM Clear key buffer
00063 X=ASC(KEY$): IF X>96 AND X<123 THEN LET X=X-32: REM Get key. If
lower case then convert to capital letter
00064 IF X=124 OR X=128 THEN 63 ELSE RETURN: REM If X=128 then no key
has been pressed. Don't let user enter ASCII 124 as this is
used as the account string delimiter
```

Display prompts and any existing text in A2% array

```
00065 FOR X=3 TO 14: CURS 1,X: PRINT [A63 32]: NEXT X: CURS 22,3:
IF W=1 THEN PRINT "00<<< NEW"; ELSE PRINT "<<< CHANGE";
00066 PRINT " DEBTOR >>>"\"First letter of NAME:00000*"; IF
K5*<>" THEN PRINT CHR(8); K5%;
00067 PRINT SPC(23-LEN(K3%)); "Date: "; IF W=1 THEN PRINT K3% ELSE
PRINT A2%(2)
00068 PRINT "Debtor's NAME: "; SPC(12); [A30 42]: CURS 27,6:
PRINT A2%(3)
00069 PRINT "Debtor's ADDRESS: "; FOR Y=7 TO 11: IF Y=10 THEN
PRINT "Re: "
00070 CURS 27,Y: PRINT [A30 42]: CURS 27,Y: PRINT A2%(Y-3): NEXT Y
00071 PRINT "Reference: "; SPC(16) [A12 42]: CURS 27,12: PRINT A2%(9)
00072 PRINT "Amount: "; SPC(19) [A9 42]: CURS 27,13: PRINT A2%(10)
00073 CURS 1,16: PRINT [A63 32]; CURS 1,16: RETURN

00074 GOSUB 73: CURS 30,16: PRINT "-Wait-"; CURS 0: RETURN
```

FREE from
Australia's largest computer mail order company.
MICRO-EDUCATIONAL P/L
8/235 Darby St NEWCASTLE 2300

OUR LATEST LIBRARY DISK FOR YOUR **APPLE, IBM, or MAC**

(Add \$10 for Mac 3.5" disks) These disks contain the best in public domain software. Send 6 x 36c stamps to cover post.

Dear George,

Please rush me a free library disk for my IBM/APPLE/MAC
(Add \$10 for Mac disks. Enclosed please find 6 x 36c stamps.

NAME: _____

ADDRESS: _____

P/CODE: _____

For Real Programmers:

WANT TO

- * GET IT RIGHT FIRST TIME?
- * COMPLETE IT IN RECORD TIME?
- * KEEP IT RIGHT?
- * REDUCE MAINTENANCE COSTS?

IF SO

THEN

Write it with
STYLUS
THE Structured
program editor

ELSE

try our \$25
demonstration
package

STYLUS is a radical breakthrough in program design methodology. It's a new tool which works with sets of logic (NS) diagrams as easily as you now handle words. The benefits of structured programming are just a key stroke away.

Program without labels, line numbers or GOTOS. **STYLUS** forms a structural "front end" for a broad spectrum of languages such as Basic, PL/I, C, (Turbo) Pascal, dBase and FORTRAN.

The Basic package comprises the program editor and Basic translator which converts logic diagrams into structured Basic (ASCII) source code for execution, compilation or for transmission to a remote mainframe.

Includes massive help screen system which includes tutorials on the principles of structured programming plus references and bibliography.

STYLUS runs under DOS 2 (or later) on the IBM PC/XT or AT and close compatibles, Apricot, Olivetti and the NEC APC III (native mode). Mono and colour screens supported.

Please enquire for details of site licencing prices.

Here's the point —
Clip the coupon now. Try **STYLUS**
and to be blunt — you'll buy it!

STYLUS

From

PCode

- ☐ Send Basic Demo \$25.00
- ☐ Send full Basic system \$185.00
- ☐ FORTRAN 77 translator \$84.00
- ☐ other translator(s) at \$68.00
(languages)
- ☐ Computer
- ☐ Here's my cheque/money order
or Bankcard/Mastercard number

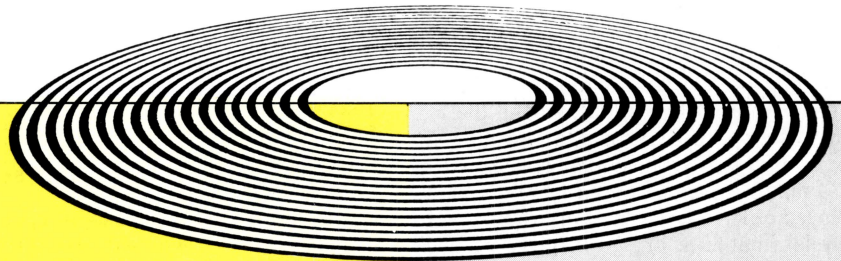
.....

expiry date

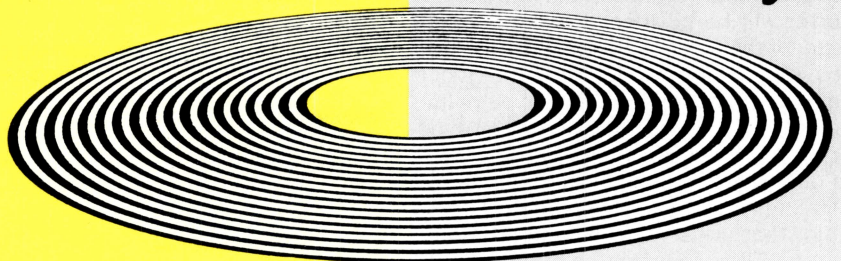


Signature

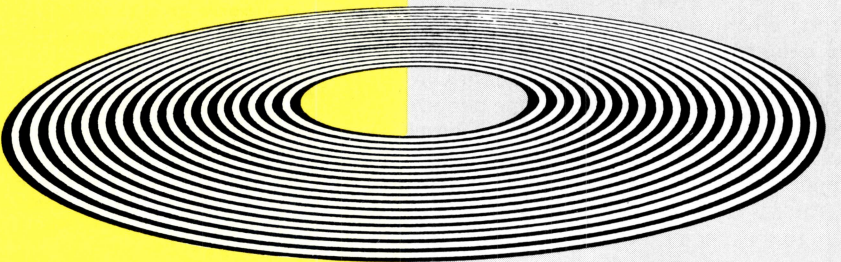
Mail to: Stylus Software Pty Ltd
31 Glennell St. Blaxland NSW 2774
'phone orders/enquiries
(047) 39-4749
(formerly Grouse Bell & Assocs P/L)



Twenty



Turbo



Tips

— Part 1

*Borland International's
Turbo Pascal has, for
many of us, revolutionised
the way in which we
program. In this two-part
article, Peter Hill (one of
those in revolt) shares 20
ways of making life with
Turbo Pascal more fun.*

TURBO PASCAL, now in its third release, has more than 400,000 users worldwide. Its speed, power and *especially* its low price have done more to introduce Pascal and structured programming to the mainstream of microcomputer users than all the efforts of Pascal proponents and structured-programming *aficionados* combined.

Turbo Pascal has also attracted a deal of criticism. On the one hand, some of those who are familiar and comfortable with BASIC or assembly language have raised their eyebrows at the 'tyranny' of its structure and the need to pre-declare all variables; on the other, esoteric arguments about Borland's adherence to the ISO Pascal standard and potential difficulties with portability of standard Pascal programs from mainframes have been raised.

While this article is not a defence of either camp, I feel it's worth stating my own position: I use whatever language will suit my immediate needs, and for some time nearly all my needs have been met by Turbo Pascal versions 2 and 3 (although I'm looking forward with interest to the release of Borland's version of Modula 2). I don't port software between mainframes and micros; if you do, you may find the arguments about portability of some relevance. If you don't, I believe it is not unrealistic to say Turbo Pascal has now become the defacto Pascal standard for microcomputers.

I don't believe that Turbo Pascal is perfect. In particular, the limitations on program size and data space dictate against its use for major projects; it is, however, sufficiently fast and flexible for medium-size projects and writing utilities.

Having got that off my chest, it's time to turn to the meat of this article. The following Turbo tips are things I have picked up in my Turbo travels which I thought worth sharing.

Tip 1. Disk Directories

BASIC users will initially be dismayed that the simple FILES '*.*' procedure of various BASICs is not available in Turbo Pascal. Indeed, writing such a procedure in Turbo Pascal requires some knowledge of interrupt procedures. Listing 1 (Program Diry) is suitable for incorporation within programs which require an equivalent to BASIC's FILES statement.

It is possible to modify and extend this program fragment substantially to show

```
PROGRAM Diry;

(
  P.R.Hill  Last modified 27/4/1986
  Copyright HILLSOFT 1986
  Not for sale or commercial distribution, but may be freely
  distributed
  alone or within users programs
)

TYPE
  Regset          = RECORD
                    ax,bx,cx,dx,bp,si,di,ds,es,Flags : INTEGER;
                  END;
  FileNameType = ARRAY[1..80] OF CHAR;
  Str80         = STRING[80];
  Dta_Def       = RECORD
                    Filler   : ARRAY[1..21] OF BYTE;
                    Attribute: BYTE;
                    FileTime : INTEGER;
                    FileDate : INTEGER;
                    FileSize : ARRAY[1..2] OF INTEGER;
                    FileName : FileNameType;
                  END;

CONST
  Carry = 1;
  Directory = $10;

VAR
  Pattern      : STRING[40];
  Size         : REAL;
  TotalSize    : REAL;
  NrFiles      : INTEGER;
  VolLabel     : Str80;
  Marker       : CHAR;

PROCEDURE Recurse;
VAR
  Dta      : Dta_Def;
  Param    : Regset;
  SearchStr : STRING[70];
  r1,r2    : REAL;
  DtaSave  : ARRAY[1..2] OF INTEGER;
  FUNCTION Pack_Name(VAR Location; Size : INTEGER) : Str80;
  VAR
    Counter : INTEGER;
    InterimStr : Str80;
    Letter    : ARRAY[1..1000] OF CHAR absolute Location;
  BEGIN
    Counter := 1;
    InterimStr := '';
    WHILE (Letter[Counter]<>chr(0)) AND (Counter <= Size) DO
      BEGIN
        InterimStr := InterimStr+Letter[Counter];
        Counter := Counter+1;
      END;
    Pack_Name := InterimStr;
  END; (Function Pack_Name)
```

Listing 1. Listing a directory.

TURBO TIPS

```

BEGIN (Procedure Recurse)
  WITH Param,Dta DO
  BEGIN
    ax := $2F00;
    MsDos(Param);
    DtaSave[1] := es;
    DtaSave[2] := bx;
    ax := $1A00;
    ds := Seg(Dta);
    dx := Ofs(Dta);
    MsDos(Param);
    ds := Seg(Pattern[1]);
    dx := Ofs(Pattern[1]);
    ax := $4E00;
    cx := $FF;
    MsDos(Param);
    TotalSize:=0;
    WHILE (Flags AND Carry) = 0 DO
      BEGIN
        SearchStr := Pack_Name(FileName,sizeof(FileName));
        IF ((Attribute<>16)
          AND ((Attribute AND Directory) <> 0)
          AND (SearchStr <> '.')
          AND (SearchStr <> '..')) THEN
          BEGIN
            SearchStr := SearchStr+chr(0);
            ax := $3B00;
            ds := Seg(SearchStr[1]);
            dx := Ofs(SearchStr[1]);
            MsDos(Param);
            Recurse;
            ax := $3B00;
            SearchStr := '..'#0;
            ds := Seg(SearchStr[1]);
            dx := Ofs(SearchStr[1]);
            MsDos(Param);
          END
        ELSE
          BEGIN
            r1 := FileSize[1];
            r2 := FileSize[2];
            if r1 < 0 then r1 := r1+65536.0;
            if r2 < 0 then r2 := r2+65536.0;
            REPEAT SearchStr:=SearchStr+' '
              UNTIL Length(SearchStr)=13;
            Size:=(r2*65536.0+r1)/1000;
            TotalSize:=TotalSize+Size;
            IF Size<1 THEN Size:=1;
            CASE Attribute OF
              8:VolLabel:=SearchStr;
              2,35,38,39 :(this is hidden);
              16:Write(SearchStr,'sdir ',CHR(179),' ');
            ELSE
              BEGIN
                Write(SearchStr,Size:3:0,'k ',CHR(179),' ');
                NrFiles:=NrFiles+1;
              END
            END;
          END;
        END;
      END; (Case)
    END;
    ax := $4F00;
    MsDos(Param);
  END;
  ax := $1A00;
  ds := DtaSave[1];
  dx := DtaSave[2];
  MsDos(Param);
END; (Main body of program)
Write('Pattern ?:.');
Read(Pattern);
IF Length(Pattern)=0 THEN Pattern:= '*. *';
ClrScr
NrFiles:=0;
VolLabel:='';
Pattern := Pattern+hr(0);
Recurse;
WriteLn;
HighVideo;Write('>');LowVideo;
Write('Total of ',TotalSize:4:0,
  ' kB',' in ',NrFiles,' files ');
IF VolLabel<>' ' THEN
  BEGIN
    HighVideo;Write('>');LowVideo;
    Write('Volume label ',VolLabel);
  END;
WriteLn;
Write('Press any key to continue....');
REPEAT UNTIL KeyPressed;
ClrScr;
END.

```





With so many really expensive PCs available, why are people still buying our Classic Microbee?

Buying a personal computer is a little like buying a camera. There are always new models coming out, each one generally a little fancier than the last — and often with a price tag to match.

When it's all boiled down, though, the best camera for most people generally turns out to be an easy-to-use, fairly basic model without all the expensive bells and whistles. And the same tends to apply with personal computers.

That's why so many people are still buying our Classic Microbee models, despite the flood of fancy new models.

The fact is that most people use personal computers for basic jobs like word processing, spreadsheet planning, managing a small database, or as a communications terminal. For things like this, an 8-bit Classic Microbee

is generally just as good as any — and it'll cost you a great deal less than most.

Our latest Premium models come with 128K of memory and your choice of either 3.5 inch or 5.25 inch floppy disk drives. You can select either a single disk drive for economy, or twin drives for greater convenience. In each case they come complete with the widely-used CP/M operating system, enhanced with Microbee's own special user-friendly shells for easy operation. Plus a set of basic applications software: a word processor, Telcom and Videotex communications and so on.

We can supply a range of matching video monitors, from low-cost monochrome (green or amber) to top-quality RGB colour. We can also provide printers, modems and other accessories.

All for prices well below those you'll find

elsewhere. A Premium 128K model with single floppy disk drive and monitor costs less than \$1200, while a twin-drive model complete with printer and modem still costs less than \$2200.

How can we do it? Well, we've been building the Classic Microbee right here in Australia for nearly five years now, improving the design all the time. We've made and sold over 60,000 of them now, and this has made us very efficient in producing them.

Call into one of our Computer Centres or dealers for a demonstration. You'll be pleasantly surprised.

 **microbee**
computer

Sydney: Ryde (02) 886 4444
Waitara (02) 487 2711
Melbourne (03) 817 1371

Canberra (062) 51 5883
Newcastle (049) 61 1090
Gosford (043) 24 2711

Brisbane (07) 394 3688
Adelaide (08) 212 3299
Perth (09) 386 8289

New Zealand: Auckland (09) 88 1138
Prices quoted may be subject to
change without notice

directories only, show files only, show the long file form including date and time of file creation, or to show hidden and system files. I have presented a short version because it provides the basic functions without being excessively long. In order to incorporate it in a program, you should make the following modifications:

1. change the top line from PROGRAM Diry; to PROCEDURE Diry;
2. change the last line from END. to END; {Procedure Diry}
3. place the line {\$IDiry.Inc} in your program
4. name the above procedure DIRY.INC

Tip 2.

Fast Screens

Turbo Pascal generates 'well-behaved' code; that is, the code it produces does not directly address hardware, but rather works through the MS-DOS and ROM BIOS function calls. This ensures a degree of portability across various machines. However, one unfortunate consequence is functions such as writing to the screen can be *v-e-r-y* slow.

One solution to this problem is to directly address the part of memory dedicated to maintaining the screen. This approach does reduce portability, as other MS-DOS computers, such as the NEC APC III and the Hewlett-Packard HP150, use different memory addresses for the screen. But the problem is not insurmountable, since the code can easily be modified for the particular machine if the correct screen-memory address is available. If you are wondering whether this is worthwhile when compared with the simplicity of using Write or WriteLn, then I can only add this gives an almost instantaneous screen refresh for a complete screenful of text!

Listing 2 illustrates the use of the procedure Write—A—Line (WAL) instead of Write or WriteLn. The parameters which are passed to this procedure are –

Attr – the video attribute required (see Table 1);

Return – if a carriage return is required at the end of a string, pass a value of 1, else pass a value of 0;

C – the column to start the string;

R – the row to start the string;

CurrentStr – the string to display.

Essentially, this routine places the ASCII values of the characters directly into memory locations which happen to be the memory locations allocated to the video display. The value \$B000 (Hexadecimal B000 or Decimal 45056) is the starting address of video memory, and C is the calculated offset from this starting address, dependent on the row and column desired. The starting address given above is for the monochrome adapter. For the colour-graphics adaptor, you should substitute \$B800 for \$B000 in the above. The attribute you require can be derived from the video attribute list in Table 1. You get the attributes by adding together the desired characteristics; for example –

$$128+2+8+64=202$$

will give you a bright, blinking green foreground on a red background.

A call to the procedure WAL within the body of a program might look like this:

ThisStr:='Bright green on black';

WAL(10,1,15,5,ThisStr);

The result of this will be equivalent to the standard Turbo Pascal statements:

ThisStr:='Bright green on black';

HighVideo;

GotoXY(15,5);

WriteLn(ThisStr);

LowVideo;

As you can now see, this is a more compact method of writing to the screen. As you will see when you use it, it is also *much* faster. You'll appreciate it when you have a full screen of text to present.

Tip 3.

Redirection of Input/Output

While this process is described in the Turbo Pascal manual, it would not be unkind to say some clarification could benefit the less-technical user. MS-DOS (and, of course, PC-DOS) allows redirection of input and output. This means the output of one program can serve as the input to another, and vice-versa. Using this facility, it is very simple to write a number of small utility program which can feed off each other. In combination, these trivial programs can add up to a very flexible set of extensions to the operating system. The two examples below can be used together to create an uppercase ASCII file from a Wordstar file, in the following manner:

WS2A <Wfilename|UCASE >ASCIIfile

In this command, the program WS2A is to take its input from the named Wordstar file and place the output of the operation ▷

```
PROCEDURE WAL(Attr,Return,C,R:Integer; CurrentStr:STRING[80]);
VAR
  Count,Col,LenCurrentStr :Integer;
BEGIN
  LenCurrentStr:=Length(CurrentStr)-1;
  Col:=C+LenCurrentStr;
  C:=((R-1)*160)+((C-1)*2);
  FOR Count:=1 TO LenCurrentStr DO
  BEGIN
    Mem[$B000:C]:=Ord(CurrentStr[Count]);
    Mem[$B000:C+1]:=Attr;
    C:=C+2;
  END;
  IF Return=1 THEN GotoXY(1,R+1) ELSE GotoXY(Col,R);
END;
```

Listing 2. Writing directly to the screen.

Value (Decimal)	FUNCTION
128	Blink
64	Red Background
32	Green Background
16	Blue Background
8	Intensity
4	Red ForeGround
2	Green ForeGround
1	Blue ForeGround

Table 1. Video attributes.

If you have an IBM PC or compatible

there are 2 utilities you should have...

MACE UTILITIES

- ★ **UNFORMAT** will restore all your subdirectories and files automatically on a hard disk
- ★ **UNDELETE** gets erased files back with four keystrokes and without cross-linking
- ★ **REMEDY** automatically moves files to a safe place and locks out the bad spots
- ★ **RECLAIM** automatically extracts files from unreadable disks
- ★ **CONDENSE** un-fragments up to 32 mb, doubles the speed at which programs load, find and store data by placing files in one physical piece on the disk
- ★ **SQUEEZE/SORT** in a single operation — speeds up the path by squeezing deleted references from directories

ONLY **\$153.00**

**BUY BOTH
SAVES HOURS OF WORK**

XTREE

- ★ **MOVE** files from one directory to another
- ★ **COPY**, delete or rename multiple files in different directories in one operation
- ★ **VIEW** contents of files
- ★ **SORT** files by name, size, extension or time and date
- ★ **PRINT** out all files on an entire disk — organized by subdirectory
- ★ **TAG** as many files as you want to work with, so that you can do any of the above with a single keystroke
- ★ **SHOW ALL FILES** or groups of files in all directions in one sorted display

ONLY **\$112.00**

To: **Perfect Interface (Aust) Pty. Ltd.**
Level 8, 56 Berry Street, North Sydney, 2060.
Phone (02) 957 6686

Please send me _____ copies of XTREE/MACE UTILITIES or both.

I enclose my cheque for \$ _____ or please debit my American Express, Diners Club, Visa, Mastercard or Bankcard. Plus \$6.50 Freight

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Card expires _____ Signature _____

Name _____ Company _____

Address _____

Postcode _____

Phone No. _____


```

PROGRAM WS2A;
{$G2048,P2048}
{
  ws2a...WordStar to ASCII
  USEAGE
  ws2a <infile >outfile
}
VAR
  C :Char;

BEGIN
  REPEAT
    Read(C);
    (
      IF Ord(C)>127 THEN C:=Chr(Ord(C)-128);
      C:=Chr(Ord(C) AND $7F);
      IF C<>^Z THEN Write(C);
    )
  UNTIL C=^Z;
END.

```

Listing 3. *Converting Wordstar files to ASCII format.*

```

PROGRAM Ucase;
{$P2028,G2028}
{
  Filter input to all upper case including WordStar type files
  with the MSB set.
  Useage ucase <input >output   OR
  dirlucase
}

VAR
  C :Char;

BEGIN
  REPEAT
    Read(C);
    C:=UpCase(C);
    If C<>^Z THEN Write(C);
  UNTIL C=^Z;
END.

```

Listing 4. *Lower-to-upper case conversion.*

in the named ASCII file. The '|' symbol is used to 'pipe' output from one program to another. Thus, the Wordstar file will be first converted to upper case, and the output of this procedure will be piped to the WS2A program for conversion into ASCII format.

There are a couple of points to note in the programs UCASE and WS2A: as we are using DOS 'standard' files, there is no need to specify the opening, closing or assignment of the files; and the \$G and \$P (get and put) compiler directives are essential, with the numbers following them indicating the buffer sizes allocated to each task. The uppercase conversion pro-

gram uses the standard Turbo Pascal function UpCase.

Tip 4. Buffered Input/Output

Turbo Pascal defines a standard type of file called 'TEXT'. This file is essentially a file of lines of text, separated by the Carriage Return/Line Feed combination. Such files are commonly found in many programming situations; for example, ASCII files created by word processors, PRN files created by Lotus 1-2-3, and Pascal source files conform to this type.

One feature of Turbo Pascal is the ability to set the buffer size of such files. The

default buffer size is 128 bytes, which essentially means a block of 128 bytes is read and processed, and then a new disk access is required. Although the optimum buffer size depends on the particular application, it is certain that 128 bytes is significantly less than the optimum.

For most purposes, a buffer size of 1024 bytes will result in a faster disk-access time, with fewer and quieter disk accesses. The buffer-size parameter is set when the file variable name is declared.

For example: VAR

TextFile :TEXT[\$800]

will give a 2048 byte (or 2 Kbyte) buffer size. Some experimentation is worthwhile here; larger buffers may give better results, but they also chew through available data storage if they are declared as global variables.

Tip 5. Global Gobblers

Turbo Pascal has a limit of 64 Kbytes of data-storage area. This limit can be circumvented by the use of pointers, but the technique is complex and also dependent on the actual program under consideration. One way to ensure you at least get your full complement of 64 Kbytes of storage is to minimise the use of global variables, and place variables in procedures whenever possible.

Listings 5 and 6 provide examples of this. The minor difference of including the help-file specification in the Open—Help—File procedure saves 4 Kbytes of space in the data area, since the space for the help file is only allocated when it is required.

```

PROGRAM Sample1;
VAR
  Input,Output,Help:TEXT[$1000];
PROCEDURE Working_Procedure;
BEGIN
  (* Main Program procedure*)
END;

PROCEDURE Open_Help_File;
BEGIN
  (*Open the help file*)
END;

BEGIN {Main Program}
  REPEAT
    Working_Procedure;
  UNTIL Help_Called;
  Open_Help_File;
END.

```

Listing 5. *Conserving data-storage space — 1.*

Turbo Pascal generates 'well-behaved' code, which ensures a degree of portability across various machines, but which makes functions such as writing to the screen v-e-r-y slow.

```
PROGRAM Sample2;
VAR
  Input, OutPut : TEXT[1000];
PROCEDURE Working_Procedure;
BEGIN
  (* Main Program procedure*)
END;
PROCEDURE Open_Help_File;
VAR
  Help : TEXT[1000];
BEGIN
  (*Open the help file*)
END;
BEGIN (Main Program)
  REPEAT
    Working_Procedure;
  UNTIL Help_Called;
  Open_Help_File;
END.
```

Listing 6. Conserving data-storage space — II.

Tip 6. Use Libraries

After programming in Turbo Pascal for some time, you will find you are covering familiar ground. For example, opening a text file to read in data consists of a number of steps, no matter what you are going to do with that data, namely:

- Get the file name (from input or command line parameters);
- Check the file exists;
- If it does, assign the name;
- Reset the file.

If you take the time to set up appropriate libraries of tried and tested routines for these functions, that time will be rapidly paid back. Probably about 50 percent of any conventional new program will comprise routines which are either identical to, or minor modifications of, routines

found in most other Turbo Pascal programs. By using library routines, you will achieve faster program development, more reliable programs due to bugs being progressively eliminated, and space savings because you will 'include' these routines in your programs.

Tip 7. Consistent Syntax

Pascal allows the free and interchangeable use of upper and lower case letters, together with long variable names. This makes it easier to enhance program clarity. If you are also consistent in your use of case and word separators, your code will be easy to read and debugging won't be so arduous. I use a number of conventions when writing programs:

■ Reserved words are all in upper case, such as WHILE.

■ Variables, types and standard functions are in a combination of upper and lower case, with no separators; for example, ClrScr, CountToDate, LineBuffer[n].

■ Procedures and function names are in mixed case, with the underscore as a separator, for example Count—The—Lines, Rotate—Matrix.

With this system, it is relatively straightforward to follow the source code. It is not important you adopt *this* convention; it is important you adopt *a* convention.

```
PROCEDURE Show_Indenting;
BEGIN
  In_One_Step;
  WHILE NOT Saturday DO
  BEGIN
    Day:=Day+1;
    WeekDay:=Succ(WeekDay);
  END;
  REPEAT
    Go_To_Work;
  UNTIL Saturday;
END; (Procedure Show_Indenting)
```

Listing 7. Example of code indentation.

Tip 8. Consistent Indentation

It is similarly important to have a consistent indentation approach, and one which does not unnecessarily increase the size of the code. I have adopted an approach which indents within a block of code, which is best illustrated by example. Have a look at Listing 7: this approach allows a high degree of clarity without the overhead involved in some schemes. □

Attaché Tutorial: your FREE intro to accounting

Businessmen, here's your chance to learn all about computerising your accounts, in your own time, using your own personal computer.

And the information is **FREE**.

It's all contained on a disk titled Attaché Tutorial, which presumes no prior knowledge of accounting or of computers.

All you need is knowledge of your own business and access to an IBM compatible personal computer.

Attaché tutorial is a comprehensive step-by-step guide to using each suite of the Attaché Software accounting modules. These include accounts receivable, invoicing/sales analysis, order entry, inventory control, accounts payable, general ledger and payroll.

Thousands of businesses in Australia and NZ are enjoying the benefits of automated accounting using award-winning Attaché software.

But others are missing out because they don't know where to start.

Attaché Tutorial is the answer. Just fill in the coupon below for your free disk.

**To: Attaché Software
Australia Pty. Ltd.,
10th floor, 8 West Street,
North Sydney, N.S.W. 2060.
Telephone: (02) 929 8700**

Please send me my free disk titled Attaché Tutorial. I understand I am under no obligation to buy Attaché software.

Name

Company

Address

State P/code

Telephone (Bus.)



BORLAND BOOSTS PASCAL

AS PHONECALL SHARKEY told us: a good program these days is hard to find. This profundity makes the discovery of a pair of powerhouse products from Microway even more significant.

I'll start with my conclusion: if you are a serious user of Turbo Pascal, and you want to extend your ability to grapple with the full possibilities of this implementation of the language — buy these two programs, developed by a Californian company, Turbo Power, and distributed in Australia by Microway, in Melbourne. With that off my chest, I'll look at the products themselves.

Turbopower Utilities

THE FEBRUARY 1986 issue of *Byte* designated the Utilities as "program of the month" in their *According to Webster* column. Another US publication, *Compute Language* (November 1985) described the program as "a first-class package all the way".

And indeed it is. Turbopower Utilities is designed for the IBM PC or close compatibles using DOS 2.x or higher, with at least 96 Kbytes of memory (though you can't do much with less than 192 Kbytes). It consists of three disks, a slickly produced 140-page manual, and a quick-reference card.

There are nine programs in the set. And despite what I said above about them being primarily of use to those who indulge in Turbo Pascal, five of the programs — being operating system enhancements — are independent of Turbo Pascal, and can be of real use to anyone. The other four allow detailed optimisation of Turbo

Borland International's Turbo Pascal, has become the de facto standard version of the language for micro use, with some 400,000 copies sold. As often happens with popular software products, a number of support programs have been developed by third-party companies. Tim Hartnell was bowled over in Melbourne's Chesterville Road by two such turbo-powered animals.

programs. The first three components are alone worth the cost of the package.

Let's have a look at the programs within the Utilities, one by one –

Pascal Structure Analyzer (PSA) is designed to find subtle coding problems which the compiler doesn't catch, such as variables which are referenced before they are initialised (even straight-laced Pascal programmers fall from grace sometimes), modified value parameters, or initialised variables which are never used. PSA also produces a complete cross-reference of every variable, function and procedure in your program, together with all the calls

```

Pascal Power Structure Analyzer

Main file name: product.pas
total lines: 2197    scan rate: 19.4LPS    scan time: 113.2secs
total variables: 334  warnings: 68        sort time: 10.5secs
Type menu choice (1..9):

DISPLAY MENU
1. scan all variables
2. scan warning variables only
3. scan all but "sneaky variable" warnings
4. write all results to file
5. write warnings to file
9. (yes, 9) write all but "sneaky" warnings to file
6. write program heirarchy to file
7. analyze another source file
8. quit using PSA

```

Figure 1. Screen display after the Pascal Structure Analyzer has completed processing a file.

```

Pascal Power Structure Analyzer

Main file name: product.pas
total lines: 2197    scan rate: 19.4LPS    scan time: 113.2secs
total variables: 334  warnings: 68        sort time: 10.5secs
Type menu choice (1..9):
(Wordstar) or PgDn, PgUp, ↑, ↓, Home, End, Find<F1>, Again<F2>, Quit<F10>

INSERT : PROCEDURE scope = SEARCH(3)
        declared in file ADDKEY.BOX
....warning: redefines a predefined identifier
        referenced 1 time within SEARCH(3)

N : INTEGER (VAL param) scope = CONSTSTR(2)
        declared in file PRODUCT1.INC
....warning: value parameter modified inside procedure definition
        referenced 3 times within CONSTSTR(2)
        modified 1 time within CONSTSTR(2)

S : STR88 (VAL param) scope = UPCASESTR(2)
        declared in file PRODUCT1.INC
....warning: value parameter modified inside procedure definition

```

Figure 2. Selecting option 2 in PSA gives a scan of the warning variables only.




```
Usage: DIFF [options] [OrigFile ModFile] [output redirection]
  Entering DIFF by itself will start an interactive prompting session.
  OrigFile and ModFile are DOS text filenames optionally preceded by
  drive and path name. Both files must be specified. Output of DIFF describes
  how to convert OrigFile into ModFile. Output sent to standard output.
Options:
  -DB Disregard Blank lines and formfeeds during comparison.
  -DS Disregard all Spaces (blanks and tabs) during comparison.
  -DC Disregard Case (upper or lower) during comparison.
  -DP Disregard Pascal comments during comparison.
  -DK keylist Disregard characters in "keylist" (use #n,^c for unprintables).
  -M show matched lines in the output report.
  -N[DI] do Not show lines to be Deleted from OrigFile|Inserted to ModFile.
  -NH do not show Header (Insert;Delete;Match and line no.) for each line.
  -Wn Write a maximum of n differences before quitting (0<n<32767).
  -S create an EDLIN Script instead of a list of differences.
  -B output in Blocks of inserts and deletes (cannot use with -S).
  -C output ONLY a count of the differences.
Defaults:
  All text is significant. Show deletes and inserts by line, including header.
  Process all lines regardless of number of differences. Do not create script.
Examples: DIFF -S myfile.pas myfile.bak >myfile.s00
  DIFF -W200 -DB -DS -DP -DK ; c:\pascal\lib\io.inc io.inc
MICROWAY C>_
```

Figure 3. The Difference Finder (DIFF) options — white space, case, Pascal comments or arbitrary characters can be ignored.

```
Usage: SDIR [options] [directory specification] [output redirection]
  SDIR indicates file attributes as n:normal, r:read only, h:hidden,
  s:system, d:directory, m:modified since backup.
Options:
  -A[NIE] sort by file Name|Extension Ascending.
  -A[SIT] sort by file Size|Time Ascending.
  -AT sort by file Time Ascending.
  -DM -DE -DS -DT sort in Descending order
  (two sort keys may be specified. If no key is specified the
  default is -AN -AE. If one key is specified, the second defaults.)
  -H[O] show hidden files [Only].
  -S[O] show Subdirectories [Only].
  -M[n] show files Modified since n days ago. (n defaults to 0)
  -B[n] show files Modified Before n days ago. (n defaults to 0)
  -MB show only files Modified since Backup.
  -T[O] include Titles [Only] (volume label, bytes used/remaining).
  -Sn use cluster size n for Size calculations. default from disk.
  -W write out Whole pathname with each file.
  -E write out Everything (pathname, filename, size, etc.
  -C use a Compressed format (names only) for output.
  -P[T] Print the directory at normal [Tiny] size.
Examples:
  sdir -m >today.dat sdir -dt -h -pt c:\bin\*.com sdir -b2 -mb
MICROWAY C>_
```

Figure 4. The Super Directory (SDIR) can be used with the Command Repeater (REP) for some very useful work. This is the help and options display after entering 'SDIR-?'.

made to them, and an hierarchical diagram of your program structure. PSA can handle programs which are thousands of lines long (your RAM is the only real limit) and can cope with up to 4000 variables.

Pascal Execution Timer (PET) allows you to work out just which parts of your programming are carrying the heaviest burden. If you know where in your code the computer is spending most of its time when the program is running, you'll have a pretty good idea of where to concentrate your optimisation efforts. PET measures the time spent in each procedure and function of your program, working in units of 200 microseconds. It shows the number of calls to each routine, the average time per call, and the maximum depth of recursion for each routine.

Pascal Execution Profiler (PEP) performs a similar function to the PET, but instead of simply timing the various bits of the program, PEP uses a statistical sampling routine (using a resident program which takes over the system clock, and a short subroutine which you add to your source code) to produce a graph showing where the program is spending its time. You tell PEP to sample the program from 40 to 8,000 times a second, for example. Once the program has run it produces the histogram showing what it has discovered. If you find there is one 'hot spot', you can focus on this and run the program just on this section. You can continue to zoom in on a section of the program until you're checking out a single byte. I can't imagine why you would ever want to get down to that level, but it shows the power of PEP.

Pascal Source Code Formatter (PSCF) is the last of the Turbo optimisation programs. It produces a 'pretty' listing of your source code, with a standard approach to such things as indentation, capitalisation, spacing and comments. You can also use the REMOVE option to get rid of all indentation and superfluous spaces — to 'squish up' a program. Like the other programs in the utilities, there are lots of parameters you set at the start of the run to suit your needs. In fact, when you first run any of the programs in this package, the number of possible options seem overwhelming. "Couldn't they have made it a bit easier?" I thought, but later realised that the manual explains clearly how to enter the parameters you need. It also emerges that you need all these options in order to make the tools as flexible as possible.

Pascal Power

Going OS for Enhancements

The first of the operating system enhancements is **Command Repeater (REP)**. This allows you to run — as many times as you like — any command which is typed in at the DOS prompt, in a batch file or from an external program. Since REP can read and parse information from the standard input, it can be followed by instructions which tell it what to do with a specific file. REP sends up to 255 programmable keystrokes to the program which is executed.

Pattern Match and Replace (RPL) is, essentially, a 'find and replace' job, such as your word processor offers, except it does not just look for specific strings to swap. Based on the Unix utility GREP, the command can look for matching Unix-type 'regular expressions'. You can use wildcards, tagged matches, groups and so on. RPL takes a set of patterns and files as an input, and produces lines of output based on all that input. The input and output can be of any size, limited only by disk space and an individual line length of 1024 characters.

Difference Finder (DIFF), as its name suggests, is used to find the differences between two text files. You can also tell DIFF to generate an EDLIN script to rebuild one file from the other. Not only does it do a straight comparison between two files (much as the DOS COMP command), but after finding a difference it will 'intelligently' look ahead until it can start matching again. Using the wide range of choices open to you, DIFF can be told to disregard white space, case, Pascal comments or arbitrary characters.

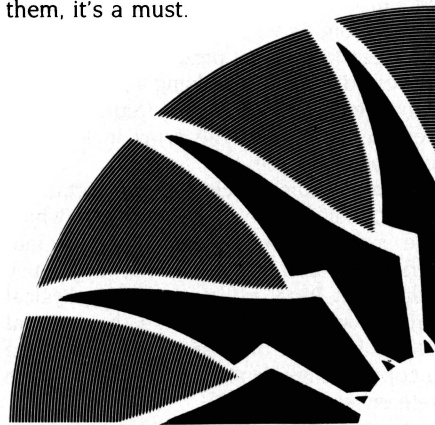
File Finder (ROOT) is a particularly handy utility; it will locate all files, in any subdirectory, to match your specifications (either specific names, or wildcards such as *.BAK to find all back-up files). Once you've got them, you can act on them (copy, run, delete and so on) using any of a number of single keystrokes (so you can delete all your *.BAK files by sending the output to a delete command running under REP).

And finally, there's **Super Directory (SDIR)**. There are several programs like this knocking around in the Public Domain, but I've seen none as flexible as this: it displays the MS-DOS disk directory with (as usual) a large number of options, including sort order, extended pattern matching, hidden file display and date filtering; and it can be used in combination with REP for some very useful work.

The Utilities come with fully-commented source code (in Turbo Pascal), along with a detailed, disk-based programmer's manual. This delves into the algorithms used in the programs, and also describes ways of using Turbo Pascal to take advantage of advanced DOS facilities.

But it doesn't end there. If you poke around the disk, you'll discover it also contains six additional utilities in source-code form: a program lister, a fast fixed-string replace utility, a character-mapping program (TRANSLIT), a utility to change file attributes, including data and time, a Wordstar-to-ASCII converter, and a binary-to-hex converter (complete with checksum support).

In keeping with the direction set by Borland, all the disks from Turbopower are non-copy-protected, there's a 140-page bound manual, and a quick-reference card. Phonecall Sharkey would approve. For the price, the Turbopower Utilities are a valuable and worthwhile purchase. If you're willing to spend a bit of time learning how to use the commands (and most worthwhile software takes a while to get the hang of, but is a joy once you've 'got it'), and if your programming needs demand any *one* of the nine commands, it is worth buying. If you want two or more of them, it's a must.



Turbo Extender

WHILE FIVE OF the nine programs in the Utilities are of value to non-Turbo Pascal programmers, this second product from Microway, Turbo Extender is aimed only at TP people.

If you've made solid use of Turbo Pascal, rather than just playing around with it creating short routines, you may well have ▶



ELECTRONICS
Pty Ltd



FEATURES

- IBM PC compatible
- 8 slot motherboard
- 640k RAM/Turbo
- Dual 360k disk drives
- Color Graphics Card
- Battery Backed Clock/Calendar
- Parallel, Serial, & Games Ports
- Composite Amber or Green Monitor
- Six months warranty

AT compatible

- 1 Meg — RAM — 360K/1.2M Drives
- Advance Orders Taken
- New Shipment \$2650

\$1515
Incl. tax

HARDWARE

M/F CARD 384K/OK	\$189
MONOGRAPHIC HERCULES ...	\$175
COLOR GRAPHICS CARD	\$145
DISK DRIVE CONTROLLER	\$85
8087 CO-PROCESSOR	\$265
20MB HARD DISK & CONTROLLER	\$1050
MITSUBISHI MONITOR. COMP.	\$190
TTL MONITOR	\$285
RGB COLOR MONITORS	\$CALL
NP2200 NLQ PRINTER 165 CPS	\$565
BROTHER PRINTERS	\$CALL
OTHER PRODUCTS	\$CALL

COMPUTER MAINTENANCE AND REPAIRS

- FAST TURNAROUND
- COMPETITIVE PRICES
- ALL WORK GUARANTEED

CALL, WRITE OR VISIT US AT:
MELBOURNE
 5, GOODWIN STREET GLEN IRIS 3146
 PHONE: (03) 29 6139

Name

Address

Please rush me:

Enclosed please find cheque/
money order for \$.....

been frustrated by the limitations of the 64 Kbytes of code and data statements. And if you're working on a large program, you have the waste of time, and hassle, of having to wait while your entire program is compiled from scratch every time you want to test it. Turbo Extender may be just what you're looking for.

There are seven programs in the Turbo Extender pack —

Large Code Model (Bigturbo) provides the ability to write Turbo programs as large as will fit into the RAM you have on board — right up to the 640 Kbyte maximum addressed by MS-DOS.

You can actually load all your code into RAM at once, and thus pass parameters and return function results using normal Pascal syntax, with no limitations on which routines may call one another.

Any number of sub-program modules (up to what your RAM will let you hold, of course) can be compiled separately. This means you do not have to recompile every line of your program when working in a single module.

Bigturbo works without having to resort to the usual tricks of chaining, overlays or using memory-resident code. Instead, Bigturbo programs consist of a .COM file and a group of .CHN files, which are dynamically loaded at runtime. This dynamic loading can provide an advantage in that not all of the program need be loaded at the same time. However, at other times it may be desirable to convert your Bigturbo program into a single .EXE file. While MS-DOS limits .COM files to 64 Kbytes, .EXE files can be any size up to the limit of RAM.

EXE file generator (Buildexe), takes as input the object code of a Bigturbo application, including the main .COM file and all .CHN files loaded at runtime. Buildexe processes these files and creates a single output file. Now, running Buildexe on a Bigturbo application is totally optional, but is probably a good idea if you're creating a program which you eventually want to sell. (Note you can distribute object code based on the library routines of Turbo Extender without paying royalties, provided your object code doesn't substantially replicate, or compete with, the functions provided by the Extender itself.)

Shell File Generator (Shellgen) works in two quite distinctive ways. In one mode, it creates the structural equivalent of any Pascal source file, which can then be used as a fast-compiling 'placeholder' in any

*If you are producing
Pascal programs to sell,
and you don't want you
customers to get their
hands on your fiendishly
clever code, Pascal
Encryptor (Pcrypt) will foil
them.*

large program you develop. In the other mode, it will convert a complete existing program to the multi-module equivalent form to be used for Bigturbo.

Large Data Model (Bigarray) is a routine which allows you to leapfrog over the largest data object (64 Kbytes) directly supported by Turbo Pascal, and produce one- or two-dimensional arrays of any type and size. Bigarray provides a set of routines to transparently access, build, display and store these arrays. There are five different models for large arrays supported by Bigarray, and the most interesting of these are the first and second model. The first, and fastest, supports arrays as big as will fit in your RAM, while the second lets you produce arrays as big as your disk will hold, using a paging algorithm to keep the most frequently accessed sections of the array in RAM for best performance.

Runtime Disk Cache (Cache) acts as a kind of self-refreshing RAM disk, in which the most frequently accessed disk material is stored. When the cache can use data from RAM, rather than the physical drive, it will do so. Otherwise, the material comes from the disk for normal use, while a copy of it resides in the cache for future reference.

Overlay Mapper (Overmap) comes into its own when memory space is a little tight and you're forced to use Turbo overlays. A *static* analyser tells you which procedures end up in which overlay files, as well as the size of each in its overlay group. A *dynamic* analyser tells you how many times each overlay file is read during execution, as well as the load address of each overlay module in memory. These allow you to both optimise performance, and to free extra memory for your own use.

If you are producing Pascal programs to sell, and you don't want your customers to get their hands on your fiendishly clever code, **Pascal Encryptor (Pcrypt)** will foil them. If you distribute your program as a Bigturbo-compiled module, you can stop people cracking your code, but you have to give them the Bigturbo control code as well. Pcrypt, as its name makes pretty clear, plays around with your source code so no-one, not even yourself, will be able to understand it. And as a bonus which seems pretty unbelievable, but it's true folks, an encrypted source file will compile anywhere from 15 to 400 per cent faster than the original unencrypted file, and can end up from two to seven times smaller than its unencrypted parent.

Both Turbo Extender and Turbo Utilities are supplied with a well-produced 140-page manual, a quick-reference card, and a refreshingly reasonable licence agreement, allowing you to use the packages to develop your own programs for sale, even allowing you to incorporate them in your own applications.

As I said at the beginning, if you are a serious user of Turbo Pascal, and you want to extend your ability to grapple with the full possibilities of this implementation of the language — buy Microway's programs. The staff at Microway knows the packages inside out and can give informed telephone support. □

Product Details

Product:
Manufacturer:

Distributed by:

Price:

Turbopower Utilities & Turbo Extender
Turbo Power,
Campbell, California, USA
Microway Software,
292 Chesterville Rd,
Moorabbin 3189.
(03) 555 4007
Turbopower Utilities \$206 exc. tax
Turbo Extender \$225 exc. tax

Coloured Computer Paper

Now available in 3 different colours,
yellow, pink and blue.

11 x 9 1/2 / 70 WORD PROC. PAPER

W250 Pack **250 sheets**
W500 Pack **500 sheets**
W1000 Pack **1000 sheets**

Also available in boxes of 2,000 & 2,500

A4 WORD PROC. PAPER

A-4250 Pack **250 sheets**
A-4 500 Pack **500 sheets**
A-4 1000 Pack **1000 sheets**

Also available in boxes of 2000

(Also pre printed STD Inv/stat formats.
All prices include S.T. Plus packing & postage)

11 x 15 PLAIN OR B.H.S

LP 250 Pack **250 sheets**
LP 500 Pack **500 sheets**
LP 1000 Pack **1000 sheets**

Also available in boxes of 2,500

COMPUTER ADDRESS LABELS

37x102— **2000 Labels**
24 x 89— **2000 Labels**

Also available in boxes of 10,000

11 x 9 1/2 Coloured computer paper

One Colour Pack **250 sheets**

Candy Pack **400 sheets**
(100 sheets each colour, plus white)



In mini
& micro packs
available from leading
computer stores now.

PHONE (03) 553 2100

DEALER ENQUIRIES WELCOME

**141 Herald Street,
Cheltenham 3192**

XENIX SYSTEM V

The Unix for Business & Commerce

NOW AVAILABLE

XENIX 286: IBM AT & close compatibles, TI PRO, Olivetti M28, Compaq, NCR PC8, Mitsubishi 286, Corona ATP, Sperry PCIT.
XENIX 86: IBM XT & close compatibles, ITT, Olivetti M24, Sperry, Wyse, Compaq, Ericsson, Leading Edge, Mitsubishi, NCR PC86, Tandy 1200.
XENIX 68K: Macintosh XL.
XENIX 11: PDP-11/23, PDP-11/73, Pro 350, Pro 380. (Note: XENIX 11 is not System V).

WHY XENIX?

- Full commercial support and training.
- Wide and local area networking.
- Multi-user, Multi-tasking.
- User access controls.
- Enhancements: File and record locking; Shared Data, Automatic File System, check and recovery.
- Inter-process communications — signals, pipes, print spooler and semaphores.
- Xenix is an entire software family.
- Xenix lets users tailor their environments.
- Electronic mail.
- Small, fast kernel — Full Unix System V optimised for speed on micro-computers.
- Xenix has been installed on more microprocessor-based computers than all other UNIX based operating systems combined.
- Expanded and improved documentation.
- Xenix is full UNIX system V, only better.
- Xenix has superior multi-tasking design.
- Xenix is tuned for the micro-computer environment.

WHY BLUE SKY?

- We have been in business since 1978.
- We have been involved with computers since our inception.
- First Xenix sold in 1982.
- We know Xenix.
- Some of our customers include: NCR — Health Commission — Commonwealth Bank — Westpac — Telecom Australia — Philips — TAFE — WICAT — Dept. Science & Technology — University of New South Wales — University of Sydney.

MEDIA TRANSFER

Blue Sky Industries designed and developed the extremely versatile system now marketed by NASHUA as the NASHUA DATA CONVERTER. • We provide a disk-to-(& from)-magnetic tape transfer bureau. • MAGTAPE — FLOPPY * UNIX — MSDOS — CP/M — CP/M-86 — PCDOS. 8" — 5.25" — 3.5"

SOFTWARE

NOW AVAILABLE

8 MPC
8 RS232 Ports with high-speed intelligent controller and Xenix Driver.

	CP/M-80	CP/M-86	PCDOS	MSDOS	Xenix V 86	Xenix 11/286
T/MAKER III integrated office						
MULTIPLAN spreadsheet						
INFORMIX relational database						
LYRIX word processing						
LEVEL 2 COBOL Ansi 74 standard						
FORMS 2 Cobol Development Tool						
ANIMATOR Cobol Symbolic debugger						
C-ISAM						
IBM MAINFRAME COMMUNICATIONS						

NEW NEW NEW NEW

SCO PROFESSIONAL I-2-3						
SCO UNIPATH SNA						
FOX BASE						
FOX BASE RUN TIME						
XENIX NET						

HARDWARE

- Winchester disk controllers for S-100, IBM PC, stand-alone.
- 8 Port intelligent communications board for S-100, IBM PC, IBM AT.
- Streaming tape back-up for Xenix.
- Statistical Multiplexers 8-16-24 ports with error correction.

Australian Distributor

BLUE SKY

BLUE SKY INDUSTRIES PTY. LTD.
2a Blakesley St., Chatswood, N.S.W. 2067.
P.O. Box 131, Lindfield NSW 2070. National: (02) 419-5579. International: +612 419 5579. Telex: 74994.

DOS-Defying Mace

Just erased the newly completed Great Australian novel? Or wiped out the company's debtors' ledger? When your fingers start working faster than your brain, its time to try a new weapon in the fight against disk-destroying dumbos. Ewart Stronach looks at the latest.

MACE n. 1. *Weapon consisting of a heavy iron club with spiked head.* 2. *Symbol of authority borne before figures of authority.* 3. *Program for the maintenance of disk files for IBM PC, XT, AT and compatibles.*

When Natalie asked me to review another disk file maintenance program my immediate reaction was 'It'll have to be good to beat XTREE.' While I had been thinking of getting a mace to control the kids, I hadn't really thought of having one to control my hard disk.

Mace+Utilities is, in fact, named after its author, Paul Mace. It does a lot more than XTREE and, according to Mr Mace, provides IBM-and-compatible users with a set of simple, powerful tools for preventing the loss of valuable work, recovering work that is lost, and disk housekeeping. Mace automatically detects data in the process of going bad and moves it to a safe area before its permanent loss; it cleans up directories; 'unfragments' existing files; and moves all available storage to the back of the disk, so newly created files will be in one piece and easily retrieved. So says the preamble to the 60 page manual. What's it like in action?

Phoenix Rising

The software won't run until its installed. To do this, you log onto drive A with the distribution disk inserted, and type 'HINSTALL C' to place the program in the appropriate sub-directory on your hard disk. Copy COMMAND.COM and CHKDSK.COM onto the same directory and you're ready to go.

To operate the program, you must place a call to RXBAK.EXE in your AUTOEXEC.BAT file. This module of Mace will then automatically cause the data necessary for a recovery from an accidental reformat to be written to another section of the disk.

After an accidental reformat, the data is recovered and the disk totally restored without further drama. This backup is called every time you boot and in fact may be called as often as you like if you are doing anything you feel may jeopardise the integrity of your disk.

From the Mace+ sub-directory, a call to Mace will display a menu. Function key F1 gives you on-line help. F3 provides an automatic diagnostic function, called Diagnose. Diagnose reads each sector of the designated drive, looking for errors: if no errors are found, it displays a map of the data area; if it cannot read a sector, it marks the screen and reports the location; if the data belongs to an active file, it will report which file and proceed to recover as much data as possible. The recovered data is written to a designated file and unreadable sections are written as a row of asterisks. If the file is an executable program, it will not work; however, text and data files may be rebuilt easily.

The F4 key simply runs CHKDSK with the /V option, reporting the degree of fragmentation of files. File fragmentation will occur with any regularly used and altered file. As disk space is filled, DOS looks for available (empty or reusable) space anywhere on the disk. This means to read a long file, the disk heads may have to move all over the disk searching for data. This adds considerable time to operations and also causes your read/write heads to do far more work than is necessary.

One Mace function allows you to collect all the fragments of a file and place them sequentially on the disk. The time saving for reading large files, such as databases and spreadsheets, is significant. When invoked, this function performs all the Diagnose functions and then reconstructs all

the files in an orderly fashion at the front of the disk. All free space is placed at the rear and all bad sectors are locked out to prevent other data being written to them. A report on the state of the files is created on disk, ready for later printing.

F6 is an automatic Squeeze/Sort. It removes deleted entries from all directories and closes up the space. This can dramatically speed up operations, particularly along complex directory paths. The Sort function moves references to other directories to the top in alphabetical order (or you may optionally decide on a sort by name, extension, date or length). You also have the option of removing the Read-Only attribute on EXE, COM and SYS files.

The use of F8 initiates the backup file mentioned in the opening. This file will be used to restore lost data or recover from accidental erasure or formatting.

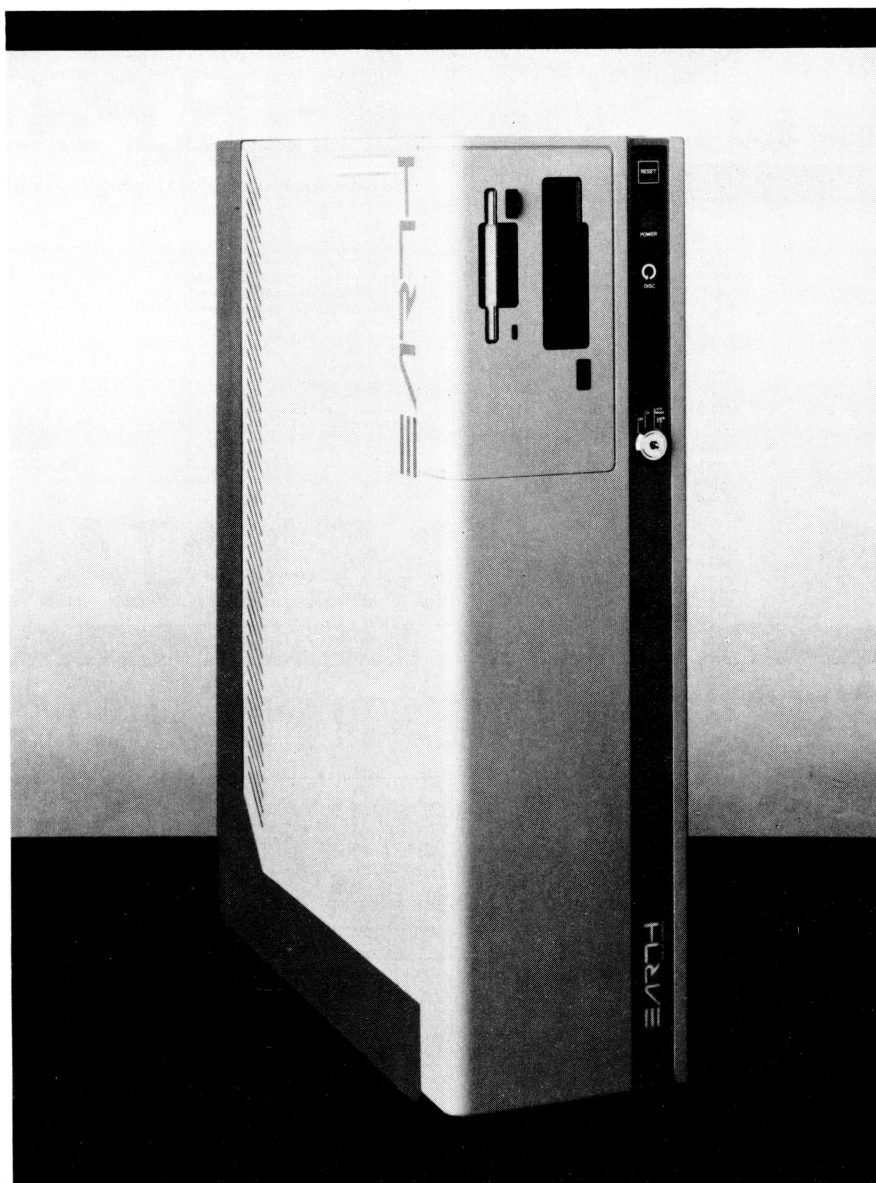
The Second Set

F2 calls a whole new set of utilities, and resets the function keys. After pressing F2, F1 offers help on the new set of utilities, and F2 now provides a semi-automatic directory call which displays directories in the normal manner. F3 will reconstruct the boot sector of the disk after a disaster, operating on a floppy as well as the hard disk if you have taken the time to install the program on your super-sensitive floppy.

F4 runs CHKDSK (as in the previous mode) and F5 (Unformat) will instigate recovery from an accidental reformat. The disk will be restored to the stage it was at the time the last backup was made with RXBAK.EXE, so it's important to make regular calls to RXBAK. If you have failed to make a backup, Unformat will partially recover from this situation but a lot of data may be lost.

In the utility mode, F6 offers most hope▷

EARTH



Earth Computer Systems V Series Computers, with their unique 12.5 Mhz no wait state motherboard and optional 10 Mhz maths co-processor, set a new standard for all personal computers.

The user has available the ultimate in processing performance with the added benefit of freeing desk space when used vertically.

Earth V Series Computers are the pacesetters, proudly Australian designed and manufactured.

EARTH COMPUTER SYSTEMS PTY. LTD.

2/15 Brisbane Street, Eltham, Vic 3095. Telephone (03) 439 4900 Fax (03) 431 1425

Which printer can silently replace all your Epsoms, Qumes, Diablos, NECs, lineprinters & LQP-02s & works ten times faster?

When you need the highest standard of presentation, the highest speed and the lowest noise levels, there is one *very special* laser printer you have to see:

The Impact Laser 800

The Impact works perfectly with your existing software, and even your dedicated wordprocessor. Our printer does this by *emulating* practically every industry standard printer. So there is no need to reconfigure software. It works with the Impact just the way it is.

Whether you need to print out a spreadsheet with Lotus, configured for an Epson FX100 or a document from WordStar configured for a Diablo 630 or from WPS™ for a LaserJet, the Impact can do it. At around 10 times the speed of a daisy wheel, to typeset quality, in complete silence.

Emulation mode can emulate a host of other popular printers in both software and hardware.

Working 10 times faster than daisy wheel printers, one Impact replaces several of them, saving office space. And of course, one Impact is cheaper to buy and maintain than printers it replaces. The Impact cartridge for the Impact works out about half the price per page compared to ribbons.

The Laser 800 has *more tapestries built in* and they are easy to use. The laser model comes with four character sets, a further eight software available and may be on-line at the same time.

Optional font cartridges further extend the range. *Very simple commands* are all that is needed to use these character sets with your existing software.

Using the "flex font" capability, the Impact transforms existing fonts into thousands of new permutations.

The Impact can generate a wide variety of output *to your specific requirements*. This includes shading patterns, forms generation, logos and photographs, *even your signatures!*

The Impact can be quickly and easily upgraded. Field service is provided Australia wide.

Start with a laser machine. Expand to a fully optional Impact with 50 fonts on-line, 2MB of memory and a multi-line sheet feeder.

You'll have to see it to believe it, so call us now for a demonstration.

LOGO

LOGO Computer Centre,
Suite 303, Henry Lawson Business Centre, Birkhead Point, PO Box 369, Drumryne 2047. Phone (02) 819 6811

Master Distributor. Dealer enquiries invited.

TECHNICAL EXCELLENCE FROM DRUMRYNE

THE PRINT

MANAGER

No Need for Plugging or Unplugging Computers or Printers

Sick of changing printer connections at the back of your PCs? Or waiting while your printer grinds through a document? You need a Print Manager.

A Print Manager saves a huge amount of time:

- 1. No more plugging or unplugging printers.** The Print Manager comes to the right printer. Up to 4 computers to 2 printers, *automatically*.
- 2. No more waiting.** The Print Manager accepts data from your computer at 1 pages per second, quickly freeing it up for the next task.
- 3. Use your Laser Printer more productively.** While laser printers are very fast, there is still the need to plug and unplug, which is where the Print Manager saves the day. The Print Manager does all the connecting (up to 4 workstations). Then its 256KB buffer allows operators to *queue* jobs as they finish them, greatly boosting productivity.

There is a Print Manager to suit your requirements. Print Managers are available in most serial and parallel configurations, allowing almost any 4 computers to share 2 printers.

And we don't charge a fortune for cables either! When you need high quality IBM PC cables, call us for the lowest prices in town. At LOGO these expensive 50ft + printer cables (serial and parallel) are going for **under half this price!**

Get organised, get productive, save money - call LOGO now. Dealer enquiries invited.

LOGO

LOGO Computer Centre
Suite 303 Henry Lawson Business Centre, Birkhead Point. Phone (02) 819 6811

WHEN YOU WANT THE BEST! PH: (02) 819 6811

NEW RELEASE EGA GRAPHICS STANDARD



KAYPRO XT/AT. More AT, less money!

The Kaypro XT/AT provides performance and facilities miles ahead of the IBM AT and other compatibles, but costs far less. Don't compromise, buy Kaypro, the quality *Euro manufactured* PC with all the extras.

Compare the features and the price with any other AT on the market. An IBM PC AT with all the Kaypro's options would set you back *well over* \$12,000!

An added advantage - The Kaypro retains the 8088 processor of the PC. Final processor (8088/80286) design gives Kaypro complete software compatibility.

20% faster than an IBM AT

Under Norton Utilities benchmarks the Kaypro comes in at a scolding 5.2, as opposed to 5.2 on the "real" AT. For engineering, but spreadsheet and other power users, this is the machine to beat!

EGA graphics are standard on Kaypro XT/AT, making it perfect for CAD

The superb colour monitor is complemented by Rolis Royce EGA colour graphics. With colour resolution of 640x480 pixels, the Kaypro can be used all day in colour mode, without eye strain.

What the competition calls options Kaypro calls standard!

No other AT offers as much as Kaypro. Don't buy a computer that offers less! With Kaypro XT/AT you get the

- 1 768KB memory as standard, rather than 640KB as provided on other ATs.
- 2 A 20MB Winchester as standard, rather than a floppy.
- 3 4 spare expansion slots standard.
- 4 2 spare device slots standard.
- 5 Serial and parallel ports standard.
- 6 6 months warranty as standard (double the 3 months of other ATs).

Software worth over \$1200 is included

* MS DOS 3.1	* Starfiles
* GW BASIC	* Polywindows Desk
* WordStar 3.3	* MTE Communications
* Mailmerge	* DOS users guide
* CorrisStar	* DOS programmers guide

So if you could really use IBM AT performance, but can't cope with the price tag, call LOGO. We'll sell you something better for around half the price! Act now, prices must rise soon!

Kaypro XT/AT only \$6,750* complete

LOGO

LOGO Computer Centre
Suite 303 Henry Lawson Business Centre, Birkhead Point 2047. Phone (02) 819 6811

WHEN YOU WANT THE BEST

THE PC PROBE

THE ONLY PAPER WITH ITS CABLES PLUGGED IN!

Computer Cable Prices PLUMMET

Connecting PC to Printer no longer so Painful on Pocket!

If you have ever had to buy connecting cables to wire up your printer or modem to your PC, you'll know just how expensive those innocent looking cables are! Despite their unassuming appearance, they carry a viper like sting - to the pocket of the unassuming purchaser. Prices range from \$50 to \$80 each.

LOGO Computers of Drumryne have come to the rescue with a range of top quality, fantastically inexpensive cables. Both serial and parallel species are catered for, all at prices you can afford, according to Peter Klamberck of LOGO.

Price is based on quantity, and goes as low as **\$6.50 each* in large quantity**. However the one off price is still very low at \$25.00 each for a parallel printer cable suitable for IBM PCs and compatibles.

**See table for when applicable.*

Print Manager keeps computers and printers producing!

Sick of changing printer connections at the back of your PC, or waiting while your computer printer grinds through a document? You need a Print Manager from LOGO Computer Centre.

That Print Manager does all the switching and then, from the document at 1 page a second, in their massive 256KB buffer, the printer starts away, you leave your PC back! No more waiting time with this one. Models cater for up to 4 computers to 2 printers.

LOGO also stock a wide range of printer cables, and buffers. Everything for connecting PCs to Printers!

LOGO

LOGO Computer Centre
Suite 303 Henry Lawson Business Centre, Birkhead Point, PO Box 369, Drumryne 2047. Phone (02) 819 6811

WHEN YOU WANT THE BEST

A CARD NAMED HERCULES

Hercules has put more muscle behind improving the flexibility and speed of the IBM PC display, with the Hercules Graphics Card Plus. John Hepworth, rhino card-boy (a long-time devotee of the old Hercules card), takes this latest release through its paces.

EVER SEEN a wildlife documentary from Africa, with a shot of a lumbering rhinoceros and a few birds riding along on its back? There is no question that IBM is the rhino in the PC world, setting the standard, and forging the path. The birds? They could be the specialist manufacturers who sense a gap in the IBM line-up, and create a product for that niche.

One of the early specialist firms to achieve substantial market penetration, to the extent of forging a quasi-official video standard, is Hercules Computer Technology of Berkeley, California.

Van Suwannukul, co-founder of Hercules Computer Technology, came from Thailand. He needed to display Thai script on an IBM PC, and found that the IBM Color Graphics Adaptor did not have ade-

quate resolution. The IBM monochrome monitor had adequate resolution, but the IBM Monochrome Display Adapter was text only, with a fixed range of characters in ROM. Suwannukul's personal needs led to the design of the original Hercules Graphics Card, which allowed high-resolution graphics on the IBM monochrome monitor.

Text and Graphics

All the common video board/monitor combinations for IBM PCs have two modes; text mode (IBM calls it Alpha/Numeric) uses characters defined in ROM; graphics mode (all points addressable to IBM) writes each pixel on the screen individually.

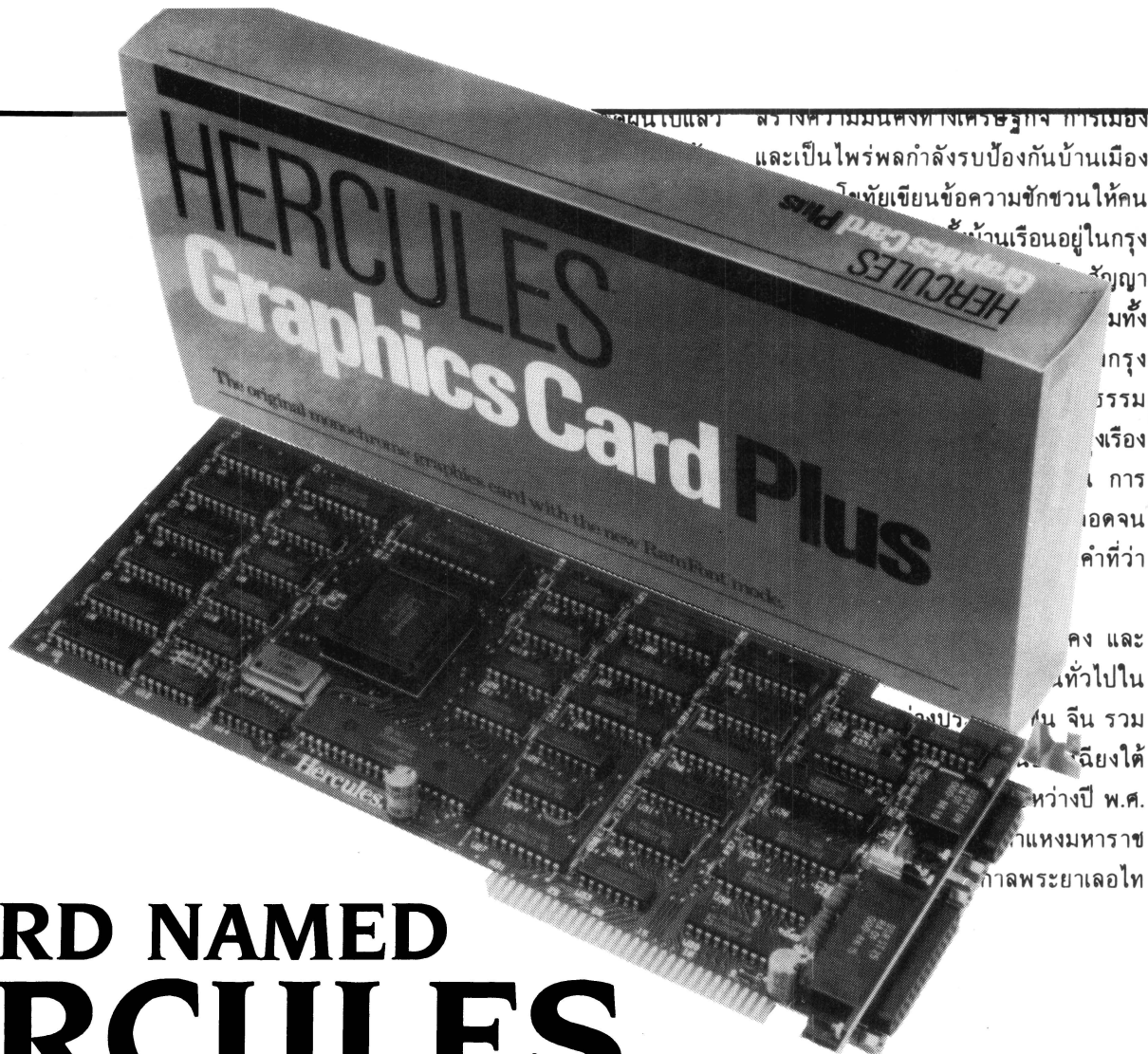
Text mode is fast. To write a capital A to

the screen, the application program only has to tell DOS to do it. The character is defined in ROM as an arrangement of pixels within a rectangle, and so can be swiftly transferred to the screen.

Graphics mode is very flexible, and essential for line and shape drawing, but rather slow when the application program has to put text onto the screen because the ROM characters are not available, and the application program must explicitly define each pixel required to display the desired character.

The ideal would be hardware which, in addition to the standard text and graphics modes, allowed a custom character set to be defined in RAM. These fonts could then be written to screen as fast as the ROM fonts.

The Hercules Graphics Card Plus is just such a board. Used in conjunction with the IBM 5151 TTL (or equivalent) monochrome monitor, it offers text mode identical to that of the IBM Monochrome Display Adaptor, and also the 720- by 348-pixel graphics mode of the original Hercules Graphics Card. In addition, the Hercules Graphics Card Plus offers 'Ramfont' mode.



คนที่เคยเจอหรือมีอาชีพที่จะต้องเบียดเบียน
ทำการป้องกันถิ่นฐานของตนทุกคน สมเด็จพระ
บรมพริยาดำรงราชานุภาพ ทรงกล่าวไว้
ในตำนานการเกณฑ์ทหารว่า

“...ลักษณะการปกครองพระราช
อาณาจักรครั้งพระเจ้าบรมวงศ์เธอ...
พระเจ้าแผ่นดินเป็นทั้งเจ้าเมือง...
กองทัพล่วง...ถ้ามีการ...
เมืองไหนก็รวมเข้ากอง...
ราชธานีจะมีคำสั่งให้...
หรือให้ไปสมทบเข้ากร...
นี้เป็นเหตุหนึ่งที่ทำ...
หิตยทรงป้องกันเมืองด...
รุกรานของขุนสามชน...
พ่อขุนรามคำแหง...
เขตออกไปกั...
อา...
คือ...
จำเ...
บริ...

เพื่อหารายได้เข้าประเทศ นับเป็นความ
ก้าวหน้าทางเทคโนโลยีและการค้าไปพร้อม ๆ
กัน นอกจากนั้น ยังเป็นตัวแทนการค้าโดย
รับสินค้าจีน เช่น ถ้วยชาม ผ้าไหม และอื่น ๆ
มาขายต่อภายในประเทศและต่างประเทศอีก
ด้วย

หลักฐานที่สะท้อนให้เห็นสภาพเศรษฐกิจ
ของสุโขทัยในอดีตที่เคยเจริญมั่งคั่งเพียง
ใด ๆ ได้แก่มรดกทางวัฒนธรรมที่ได้รับการ
ขึ้นเป็นอุทยานประวัติศาสตร์สุโขทัย
ปัจจุบัน ซึ่งประกอบด้วยซากวัดวาอาราม
นิยสถาน พระพุทธรูป ฯลฯ ถ้านับรวมทั้ง
ปวัตติ จารึก เทวรูป พระพุทธรูป ที่พระ
มหาจักรีบรมราชูปถัมภ์ กรุงรัตนโกสินทร์โปรดให้ขน
ย้ายลงมาเก็บรักษาไว้ในพระนครด้วย ก็มาก
เลยทีเดียว

แคว้นสุโขทัยและลพบุรีเป็นพันธมิตร
ใกล้ชิดกันในตอนต้น ๆ ต่างขยายอำนาจ
ทิศโดยไมแย้งกัน ได้พยายามรบ
ลเมืองไว้ช่วยกันทำมาหากิน เพื่อ

Van Suwannukul's need to display
Thai language script on an IBM PC
led to his designing the original
Hercules Graphics Card.

Ramfont

Ramfont allows the definition of up to 3000 custom characters, which can be held in RAM and then read to the screen at high speed. Why bother, when DOS only know about 255 characters? Many possibilities immediately become apparent — foreign and custom characters, extended character sets for Asian languages using ideograms, and animation. Multiple character sets could make possible desktop publishing software with high speed and true WYSIWYG display.

Foreign Characters

ROM characters only come in one font, reminiscent in style of the traditional typewriter output. What if the user wants a foreign character set — say Greek or Russian — where either some additional characters are required, or the whole character set is different? Sure, application software can be re-written to graphically display the new character set, but how can one do a task as mundane as DIR in the desired characters?

With Ramfont comes a flock of prede-

fined fonts: 8 by 10, 8 by 14, 8 by 8, 8 by 8 italic, 9 by 16 SNSF, Bigserif, Blcksnsf, Block, Bold, Broadway, Computer, Courier, Future, Greek, Hollow, LCD, Medieval, Sanserif, Script, Slant, Small, Standard, Stretch, Super, Thin and Thnserif. All but Greek are variations on the standard IBM character set.

Hercules provides a program called RAMFONT.COM, which loads a selected font file into the board and uses it in lieu of the ROM font. Suddenly all character-based activity is in the new font. If you select Greek, for example, all the characters are displayed in modern Greek script — even Wordstar, Word and all the DOS commands are in the new font.

The fonts vary in attractiveness and legibility, but even if one is not to the user's satisfaction, it can form an excellent starting place for development of a custom font using the DEBUG-like font editor called Fontman.

Animation

One of the demonstration programs provided with the Hercules Graphics Card

DIGICARD
Computer
Products
PROUDLY AUSTRALIAN

HARD DRIVE DISK

For: **APPLE II &
APPLE III**

10-62 MEGABYTE

Supports:

**DOS 3.3, PRODOS
PASCAL, CP/M, SOS
AMAZING
"RAM DISK"
SPEED**

DUAL 800K DISK DRIVE

Supports:

**DOS 3.3, PASCAL
CP/M & PRODOS**

Special price:

\$895 INC.
TAX

see review:

YOUR COMPUTER-DEC.

HIGH SPEED PRINTER BUFFER

256K of Storage

Automatically takes input from
either the serial or parallel input.
Serial or Parallel output is
switch selectable.

RRP **\$335** inc. tax

Locally supported by the Designers
and Manufacturers

**MACLAGAN WRIGHT
AND ASSOCIATES**
123 McEwan Road,
WEST HEIDELBERG 3081
Phone: (03) 458 1211

THE MOST
INNOVATIVE
AND BEST
VALUE

TURBOCAD TURBOCAD
BY PINK

IN COMPUTER
AIDED DESIGN
SOFTWARE . . .

- Easy to use.
- On line help facility.
- Dynamic panning/zooming.
- Automatic dimensioning.
- Various text fonts.
- Full windowing facility.
- Hatching and layering etc.

TURBOCAD TURBOCAD
BY PINK

ALL THIS
AND MUCH MORE
FROM ONLY

\$690*

INC. TAX

Version 1-32*

Version 1-4 Now Only **\$960**

TURBOCAD IS
DISTRIBUTED
BY:



THROUGHOUT
AUSTRALIA

33/8-24 Kippax St
Surry Hills
2010

Call

(02) 281 1300

(02) 533 0016

(07) 341 5088

For further CAD information

Plus is CHESS.COM, a simulation of a chess board during play. Here each combination of a piece and a square have been defined as a number of custom characters, which combine on screen to create the image. No longer must each square be painstakingly drawn, pixel by pixel — the sub-characters can be fired to the screen at amazing speed. The program does not play a game of chess, it is merely a demonstration using the chess image to demonstrate the way a complex picture can be rapidly constructed and moved.

Asian languages requiring 255 or more custom ideograms could also be displayed with the same technology.

WYSIWYG vs WYSIMOLWYG

Nearly every word processor on PCs claims to be 'what you see is what you get'. Unfortunately, on IBM PCs they are, at best, 'what you see is more or less what you get', though the best packages, such as Microsoft Word, are getting very close to WYSIWYG.

Most packages will only show characters with constant spacing, even if italics, justification, superscript and subscript are shown on screen. If you want to mix 8-point and 24-point type on a line, with most packages the finished product must be imagined or printed — it won't be seen on screen. Even with the limitation of constant pitch, graphics mode must be used if any special character display is needed, which means speed falls right off. Try a page layout package, which really shows the finished product on screen, and learn how slow things can become!

Ramfont offers potential solutions to these problems. Not only can those superscript, subscript, italic and other variations be pre-loaded and recalled at ROM speed, but the potential is there to write software which creates character elements, quickly giving WYSIWYG displays.

Software

Included with the Hercules Graphics Card Plus are drivers for Microsoft Word 3, Lotus Release 2, Framework II and Symphony 1.1. The Lotus driver will display a graph in a small window over the top of the worksheet. The Word driver allows Word to be used in a 90-column by 40-row mode, in addition to the 80 by 25 mode, and the additional speed offered by Ramfont when using italics, super and subscript on screen is really worthwhile.

Compatibility

Time for a quick reminder about the memory map of the IBM Monochrome Display Adaptor, the Hercules Graphics Card and the IBM Color Graphics Adaptor. IBM set aside 4 Kbytes for the video buffer, from B0000 for the Monochrome Display Adaptor, and 16 Kbytes from B8000 for the Color Graphics Adaptor. The EGA buffer overlaps this whole area.

In text mode the Hercules board emulates the IBM Monochrome Display Adaptor, and uses the same memory address. In graphics and Ramfont modes the Hercules needs a lot more memory, and is switched to either the half configuration, using 32 Kbytes starting at B0000, or full configuration, using 64 Kbytes again starting at B0000. Hercules boards use a program called HGC.COM to switch from text configuration to the half or full configuration, or the equivalent code can be incorporated into the application program. A program called SETMODE.COM is used to switch to and from Ramfont modes, and equivalent code can be incorporated within an application program or driver.

In full mode the Hercules video buffer overlaps the area reserved for the IBM CGA, and one or the other must be removed. The same restriction also applies to all the third-party video boards which emulate the IBM CGA, except for Hercules' own CGA adapter. The half mode ensures that, if a CGA is also in the system, the Hercules and the CGA will not conflict over memory addresses.

Software compatibility is a different matter. Software written to use the text mode will run on any mono, CGA, EGA or Hercules board without problems. Graphics software must be written for the individual board — CGA graphics software will not run on EGA or Hercules. Fortunately, most serious packages have for years included support for Hercules Graphics, still one of the finest graphics displays available. On test, the Hercules Graphics Card Plus ran all software written for the previous Hercules Graphics Card, without any glitches or variations in performance.

Do-it-Yourself Graphics

Writing your own graphics software for any Hercules board is not difficult, but the board isn't directly supported by IBM's BASICA. Past Hercules users will be aware of HBASIC.EXE, the patch to BASICA which comes with the board. This allows use of graphics in interpreter BASIC on ▶



WHEN ONLY THE BEST WILL DO.

CC2255/85 JMT016P649K1

• The Pace • The Feel • The Space • The Ride

SUBSCRIBE

receive **A FREE AM/FM**
and your chance to **WIN A**



CONDITIONS OF ENTRY

1. Entries close last mail February 27, 1987.
2. Entry to the prize draw is achieved by returning a completed subscription card and payment. Entry is open to both new and renewal subscribers.
3. Entry is open to all residents of Australia other than the employees and immediate families of The Federal Publishing Company Pty. Ltd. and Daihatsu and their associated agencies and publications.
4. The draw will take place on March 4, 1987, and the winner will be notified by mail and the result published in The Australian newspaper date March 13, 1987, and a later issue of the magazine.
5. Prizes must be taken as offered. There is no cash alternative. Prizes are not transferable and cannot be altered in any way.
6. The vehicle prize of a Daihatsu Charade includes all on-road costs, including third party insurance and registration.
7. Federal Publishing will arrange delivery of the vehicle within Australia within one month of the winner being drawn. If delivery is required outside of Australia, this becomes the responsibility of the winner.
8. Permit No.: T.C. 862203 issued under the Lotteries and Art Unions act 1901; Raffles and Bingo Permits Board Permit No. 861013 issued on 15/9/86; ACT Permit No. TP86/650 issued under the Lotteries Ordinance, 1964.

• The Luxury • The Style • The Eco

NOW!

WEATHER PROOF RADIO "CHARADE" from "DAIHATSU"

FREE RADIO

with all new or renewed subscriptions



- ★ AM/FM Radio
- ★ All Weather Speakers
- ★ On/Off Volume Control
- ★ Tuning Control
- ★ Bicycle Mounting Bracket
- ★ Handy Carry Strap
- ★ Operates on 4 x "AA" size batteries (batteries not included)

(1. The "Free Radio with Paid Subscription" offer expires last mail, February 27, 1987.
2. Faulty radios not returned to The Federal Publishing Company within 60 days of receipt cannot be exchanged.)

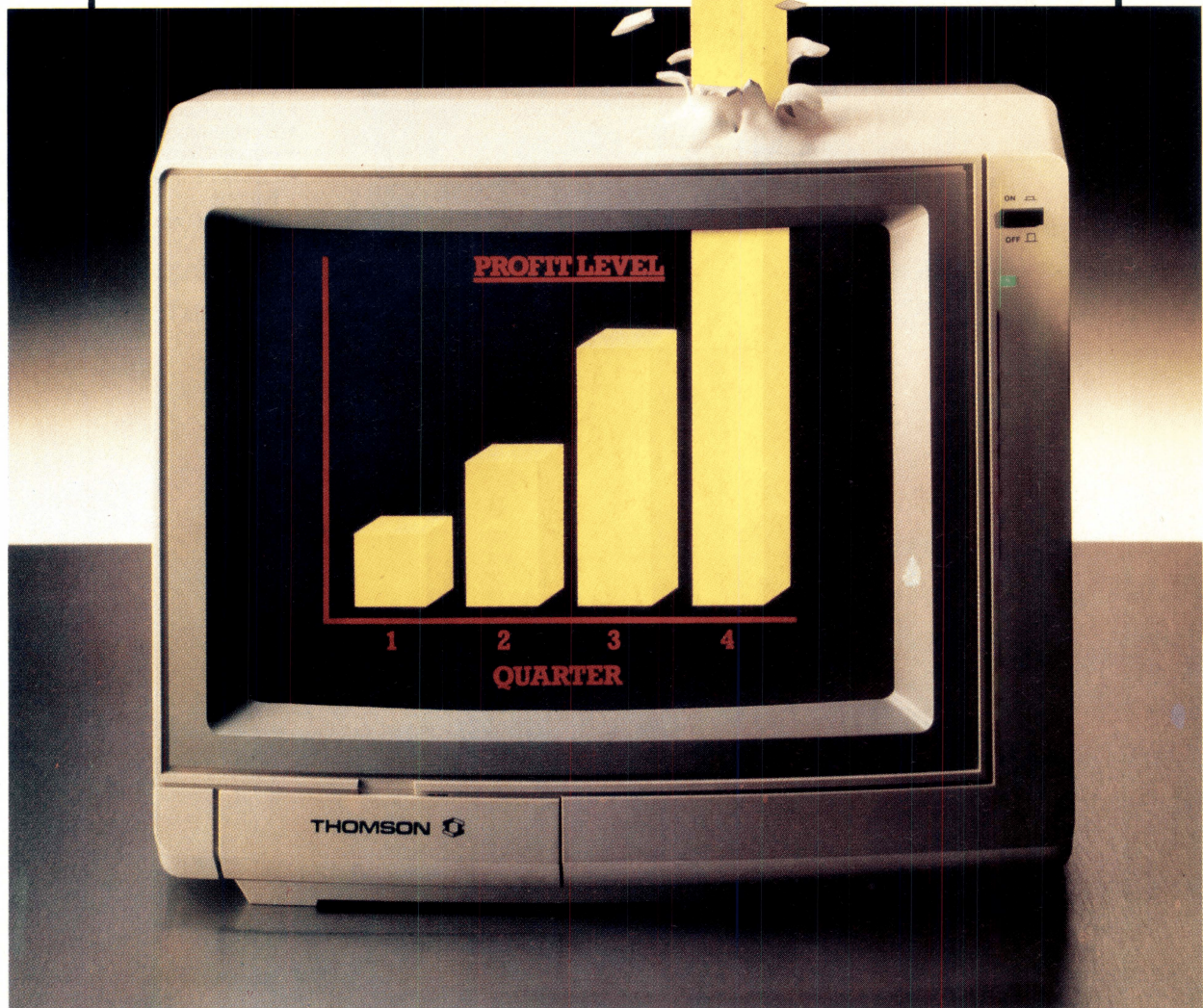
LIMITED OFFER, SO POST SUBSCRIPTION CARD TODAY!!
(If card missing, please phone (02) 693-6666 and ask for the Subscriptions Department).

"Daihatsu. 
That's who."

*See Subscription
Coupon*

• The Ride • The Space • The Feel • The Pace • The Options • The Safety

You get more out of a Thomson Monitor.



Thomson's superior standards show through – clearly. Sharper characters. More brilliant graphics. Eye fatigue reduced. Headaches eliminated. You get much more from your computer hours.

Ten economical green, amber and colour models for all popular PCs.

For a dealer near you contact –

THOMSON 

Thomson. Simply, the world's best monitors.
Phone (02) 290 1122 for your nearest outlet.

CLAUDE 3817

This is the standard IBM character set. With the underline attribute.

This is a sanserif font, here's a new attribute too — overstriket

Here is an 8x8 character set, and now 8x8 italics.

This is an example of a Courier font.

And this one is called the "Filled"font.

Hepc uc raxc x Ipxek Gouv. AB ΔΕΘΤΗΙ ΚΑΜΝΟΠΡΕΤΥΧΩΣΖαβςSe0yn t κμυονφpcrvXw

We call this the "Hollow" font. [the hollow font in reverse video]

An example of an 8x8, single pixel font. This one can take good advantage of the new BOLDFACE attribute.

While we are still looking at the boldface attribute, how about a script font?

THIS FONT WAS INSPIRED BY STARTREK SO IT SHOULD BE CALLED THE "STARTREK" FONT.

THIS CHARACTER SET CONTAINS DIFFERENT SYMBOLS ONE MIGHT FIND USEFUL.
V < ∇ Э ⊕ + n € + → z ♣ = , T B @ . ~ κ || = X Y Z α β γ δ ε ζ η θ ... j n² xyz

Physical Appearance

The usual rear metal bracket is provided to fix the board to the rear of the computer. A female DB25 parallel printer connector and a female 9-pin video connector are mounted on the bracket. The parallel port can be selected as LPT1 or LPT2 by removing or replacing a socketed chip. Typical of attention to detail is the anti-static bag packaging the board, and the conductive foam for storing the removed chip, plus the provision of a parallel printer cable of exceptionally high quality — right down to integral thumbscrews so that it can be

The Future

which work at adequate speed. The Hercules Graphics Card Plus is the hardware part of the solution, and offers real opportunities for software developers who get behind it, while the drivers for Lotus, Symphony, Framework and Word 3.0 give immediate opportunities for users of these popular packages to get a head start in realising the advantages of Ramfont. □

Product:

Manufacturer:

Review Copy From:

Price:

Hercules Graphics Card Plus
Hercules Computer Technology,
2550 Ninth St, Berkeley, CA 94710.
Arcom Pacific,
252 Abbotsford Rd, Mayne 4006
(07) 52 9522
\$595 RRP

DOCUMENTATION [REDACTED]

EASE OF USE

DESIGN **RELIABILITY**

VALUE FOR MONEY

FOR SMARTIES

In this month's argumentative instalment, Les Bell examines ways of passing parameters to programs, flags down a command line, and throws in an appendage.

argc, argv

THE C LANGUAGE is, of course, designed to operate primarily with the UNIX operating system, and many of its features reflect both demands UNIX makes on the language and opportunities it offers in turn. One of these features is the passing of arguments from the operating system command line to a C program.

Those who have used the CP/M and MS-DOS operating systems will know they pass command-line arguments in the default DMA (Direct Memory Access) buffer, as well as parsing the first two filenames into the default file control blocks (FCBs). The user still has to move one of the default FCBs out of harm's way, as well as parsing the command-line tail.

UNIX is nowhere near as crude, and fortunately (*almost* without exception) C compilers emulate the UNIX behaviour when running under CP/M and MS-DOS.

UNIX passes arguments to a C program through two parameters, in exactly the same way as if the `main()` function was in fact a sub-function of some larger program — which, in a sense, it is. The two parameters which are passed are `argc` and `argv`, which are declared and used in the following way:

```
main(argc, argv)
int argc;
char *argv[];
{
    ...
}

or

main(argc, argv)
int argc;
char **argv;
{
    ...
}
```

Both declarations for `argv` are the same thing: `argc` is the number of arguments on the command line and `argv` is an array of pointers to the arguments, wherever they are in memory.

The number of arguments on the command line includes the name of the command itself. If you write a program called `fido`, and then invoke it with the command line

```
fido arg1 arg2
```

then `argc` will be three. There will be three arguments, called `*argv[0]`, `*argv[1]` and `*argv[2]` respectively. While UNIX actually

passes `*argv[0]` to a program — it has to, because a program could have been invoked under an alias and may need to modify its operation depending on what it has been called — other operating systems may not pass the command name. Under CP/M and MS-DOS, you always know what the program is called, in any case.

Perhaps the simplest example of command-line argument usage is the `echo` program (Listing 1) which simply echoes its arguments back to the command line.

As an exercise, enter a sequence of arguments — they can be anything — using the `v` command and then run the `echo` program. See how it reacts.

Take a look at the `printf` line in the program. Why does it have two format strings, `%s` and `%c`? What happens if the `%c` and everything from `(i<argc-1)` through to `'\n'` are taken out? What is the function of the conditional expression `(i<argc-1) ? ' ' : '\n'` in the `printf` statement?

Command-Line Flag Processing

Quite commonly, C programs and utilities are controlled by command-line flags, which generally consist of a hyphen followed by one or more letters. Listing 2 is an example of a function which can process such command line. Listing 3 indicates how such a function may be called from a program.

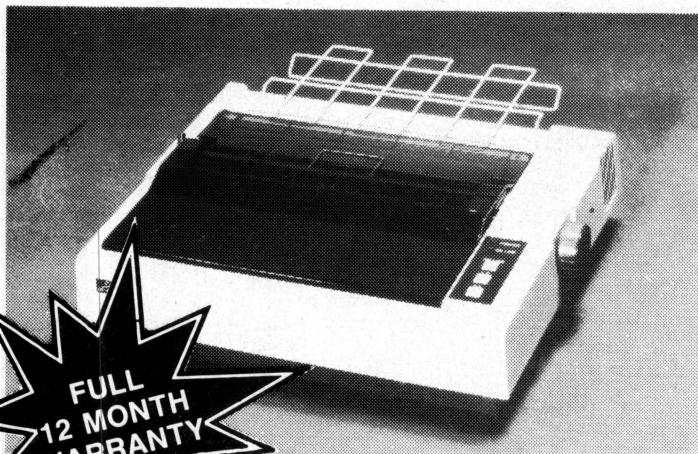
Finally for this month, Listing 4 is a short program which DOS users will probably find handy for modifying `AUTOEXEC.BAT`, `CONFIG.SYS` and other text files. It's called `ATC`, and its purpose in life is to append a line onto the end of the specified file. It works in two ways; you can either type a command like:

```
AT les.tdo
```

Finish off C compilers review which will append the line 'Finish off C compilers review' to the end of the file `LES.TDO`, or you can type something like `AT phones.dir`

Sakata DOT MATRIX PRINTERS

Your Personal Computer Deserves the Unequalled Printer Quality of Sakata.



The High Reliability SP-1200 plus

- Fast and Neat, 120 cps
- Excellent Near Letter Quality mode
- Numerous modes, fonts and pitches
- Width from 80 column (PICA) to 136 column (CONDENSED)
- Very sharp BIT IMAGE graphics
- Adjustable sprocket and friction feed
- IBM-PC command compatible
- Parallel Centronics interface (serial option)

only \$597 including Sales Tax

Also available

SP-1500 180 cps, 80 column, NLQ \$779

SP-5500 180 cps, 136 column, NLQ \$1015

SOLE AUSTRALIAN AGENTS

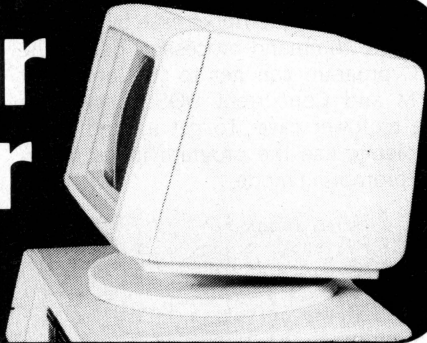
EMONA COMPUTERS

PTY LTD

1st FLOOR, 720 GEORGE ST, SYDNEY, PH: (02) 212 4599



Connect your Brain to your Computer.



You can make the connection with your hands in less than a week simply because the computer makes it quick and easy.

Once you can touch type you will be able to transfer your thoughts and information through this connection at an incredible rate — faster than hand writing.

Typequick IV. The way to feel totally at ease with your computer.

Typequick — the professional keyboard training course; a proven success with thousands of people • In hundreds of large corporations, colleges and homes. • By executives, managers, students and professionals. Sold throughout the world! Winner of "Top Australian Software of the Year 1985."

Runs on most computers — PC DOS, MS DOS, APPLE IIe/IIc, CP/M, CP/M86. Distributed by IBM, DEC and Tandy and sold by considerate dealers.

TYPEQUICK™

Make the connection — Order today.

Send coupon to Typequick Pty Ltd, 16 Cecil Street, Gordon 2072 or phone 498 7433. Please include \$87. Please attach your Business Card.

☐ Enclosed is a cheque/money order for \$ _____ Payable to TYPEQUICK

☐ Please credit my Bankcard/Mastercard

Signature _____

Expiry Date of Credit Card _____

Card No. _____

Name _____

Title _____

Address _____

Postcode _____

Computer Type _____

Operating System _____

YC 1286

>Whelan, Your Computer, 953
8171

>YC BBS, 953 8074

>

The final blank line signals the end of input.

If you try this program, you'll find strange results in certain circumstances and under certain operating systems. First of all, if you type in the line to be ap-

```
main(argc,argv)
int argc;
char *argv[];
{
    int i;

    for (i=1; i<argc;i++)
        printf("%s%c",argv[i],(i<argc-1) ? ' ': '\n');
}
```

Listing 1. Echo Program.

Listing 2. ▷

ended on the command line, you'll find that multiple spaces — for example, to lay out a table — are reduced to single spaces. This is because the command-line processor ignores spaces and works on the words only. Under variants of the CP/M operating system, you will find your line converted into upper case by the CCP (console command processor) before the AT.C program can get to it. Concurrent CP/M and Concurrent DOS convert the line to lower case. To get around these problems, use the program in its multi-line prompting mode. □

```
/* Control flags */
unsigned short lflag, dirflag, timesortflag,hiddenflag;

char *matchstring;
static char dfltstring[] = ("*.");

main(argc,argv)
int argc;
char *argv[];
{
    /* Initialise flags, etc */
    init();
    process_options(argc,argv);

    /* Remainder of program goes here */

}

init()
{
    lflag = FALSE;
    dirflag = FALSE;
    timesortflag = FALSE;
    hiddenflag = FALSE;
    matchstring = dfltstring;
}
```

Listing 3.

```
process_options(argc,argv)
int argc;
char **argv;
{
    int i,j;
    for(i = 1; i < argc; i++) { /* For each word on command line */
        if (argv[i][0] == '-') { /* If 1st char is a '-' */
            j = 1;
            while (argv[i][j]) { /* For each character in turn */
                switch(toupper(argv[i][j])) {
                    case 'L':
                        lflag = TRUE;
                        break;
                    case 'D':
                        dirflag = TRUE;
                        break;
                    case 'T':
                        timesortflag = TRUE;
                        break;
                    case 'H':
                        hiddenflag = TRUE;
                }
                j++;
            }
        }
    }
}
```

```
else /* If 1st character is not '-', must be a filespec */
    matchstring = argv[i];
}
```

```
/* AT.C - Append line to end of text file */
#include "stdio.h"
#define MAXLINE 128
```

```
main(argc,argv)
int argc;
char **argv;
{
    FILE *outfile;
    char buffer[MAXLINE];
    int i;
    if(argc<2) {
        printf("Usage: at file line");
        exit(1);
    }
    /* open file and prepare to append line */
    if((outfile = fopen(argv[1],"a")) == 0) {
        printf("at: could not open file %s",argv[1]);
        exit(1);
    }
    if(argc>2) {
        /* Line to append is argv[2] through argv[argc-1] */
        /* Start with empty line */
        buffer[0] = '\0';
        for(i=2;i<argc;i++) {
            strcat(buffer,argv[i]);
            if(i == argc - 1) strcat(buffer,"\n");
            else strcat(buffer," ");
        }
        fputs(buffer,outfile);
    }
    else {
        /* No command line, get it from stdin */
        putchar('>');
        gets(buffer,MAXLINE);
        while (strlen(buffer) > 0) {
            strcat(buffer,"\n");
            fputs(buffer,outfile);
            putchar('>');
            gets(buffer,MAXLINE);
        }
        fclose(outfile);
    }
}
```

Listing 4. Append Program. ▷

PROTECT THESE

FROM PERMANENT DAMAGE

**IF YOU OR YOUR
STAFF USE A COLOUR
COMPUTER MONITOR
YOU MUST READ THIS.**

Why risk damaging your eyes permanently by using inferior computer monitors?

TVM offer you the **WORLD'S ONLY, ZERO DEFECT MONITOR**, with a 20% larger screen, High Resolution clarity at a price **YOU CAN AFFORD.**



**FULL
12 month
REPLACEMENT**

ASK FOR **TVM BY NAME.**

SMART BUSINESSES ARE DISCOVERING THESE ADVANTAGES AND BENEFITS OF USING A TVM MONITOR.



14", 20% LARGER, SUPER DARK, NON-GLARE SCREEN.

Cuts eye strain, improves clarity, NO daylight squinting.



X-RAY LEAKPROOF DESIGN.

NO radiation damage to eyes.



HIGH RESOLUTION COLOUR or MONO MONITOR.

4096 deeper, brighter colours.



7-COLOUR MONO DISPLAY FEATURE, PLUS WHITE REVERSE.

Choose the most comfortable colour.

**KELLER
AUTOMATION**

MELBOURNE – SYDNEY – NEWCASTLE – BRISBANE
HOBART – ADELAIDE – PERTH – AUCKLAND

14 Whiteside Road, Clayton South, Vic 3169
Tel: (03) 543 7244. Tlx: AA31781 Fax: (03) 543 5230



NEWLY APPOINTED EXCLUSIVE
AUST DISTRIBUTOR

PRICED FROM

\$395

(ex-stock)

Programmers:

Turbo-charge your productivity with PL/PC

(Programming language for the PC)

3-5 times more productive than using conventional languages.

Full APL array operators (including matrix inversion and FFT).

Integrated Programming Environment.

Modern control and subroutine structure.

Local subroutines and variables.

More than 130 built in mathematical and graphics subroutines.

One conceptual numeric type (including complex numbers).

Large memory model.

Source-level debugging.

Auto-paragraphing.

Built-in full-screen text and data editor.

Virtual file variable of up to disk capacity.

Local support via fax, phone and mail.

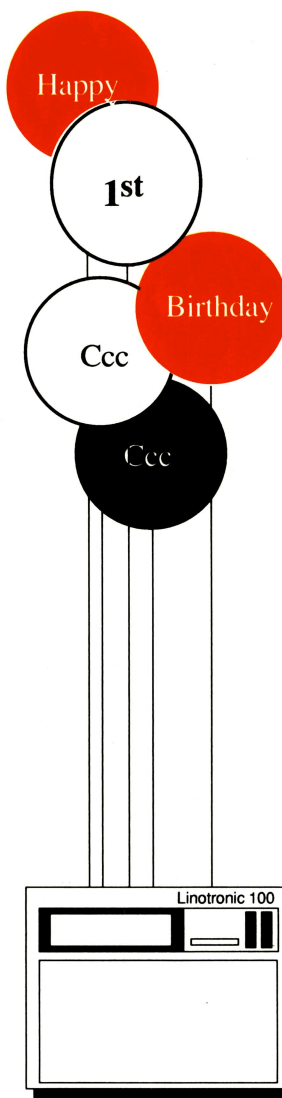
See quick reference guide
on page 12 of November
Your Computer

For only \$159
Demo version \$16

Requirements:
IBM PC or compatibles
DOS 2.11 or higher
360K bytes memory

Creative Computer Software

117 York St., Sydney, NSW 2000
Phone: (02) 261 1611
Fax: (02) 264 7161



The Complete Graphics, Typesetting & LaserPrinting Service

Now with Linotronic 100

We're having a double celebration!!

The Creative Computer Company is **one year old** and we have a **new Head Office**, located at 117 York Street, Sydney, where the Linotronic 100 Typesetting machine is available, so we can now print at four times the LaserWriter resolution, meaning high quality artwork in minimum time at minimum cost.

Important Documents, Business Reports, Manuals, Advertising Brochures etc., can be downloaded to our Macintosh machines, for quality typesetting, direct from your CPM/MS-DOS word processing files. We can fax you a copy of the finished artwork, for proofreading usually within 24 hours, saving you unnecessary trips to our office. So call in soon to find out what a difference creativity and the latest technology can make!

The

Creative Computer Company

CITY: 117 York Street, Sydney, N.S.W. 2000 Tel: 261 1611 Fax: 264 7161
HURSTVILLE: 123 Forest Road, Hurstville, N.S.W. 2220 Tel: 570 8300 Fax: 570 9873



BYTING PRODOS BACK —PART 2

Stewart Fist takes more bytes of the Apple's ProDOS and reveals how a seedling can take up a whole block in his continuing tutorial on file handling. Read on especially if you've had problems keeping Appleworks files on hard disk . . .

BEFORE WE MOVE ON, let's review the main points made in Part One.

ProDOS allocates disk space in blocks, rather than sectors (there are two blocks per sector). Free space is allocated in a strict sequence from the lower block numbers to the higher and, for this reason, ProDOS itself will always occupy the lowest blocks on a standard floppy. Block six is the bit-map recording which blocks on the disk are in use and the primary directory is at block two, with subdirectories allocated as needed and treated as normal files.

Files are treated in three different ways, according to length. If the files are less than 512 characters long (212 for Appleworks files) they are called 'seedling' files and are stored in only one block. If they are medium length (up to 128 Kbytes) they are called 'saplings', and are stored in

from three to 256 blocks. Larger files are called 'trees'.

When you re-save a file (supposedly writing over one already on the disk), ProDOS firstly writes the whole new file into spare space, and then changes the file header and the bit map to indicate the superseded file is no longer in use.

The bytes preceding the volume (disk) name in the directory block (see Figure 1) indicate: A the hex number of the previous block — \$0000 in this case; and B the block number of space allocated for main directory extension — \$0003 (read the bytes in reverse order, remember!)

The byte preceding each file name uses two half bytes to give us C the storage type, and D the length of the file name. These two half bytes are changed to zero when a file is inactive.

Deeper into the Directory Block

The bytes following the file name in the directory provide a lot of information about how and where data is stored on the disk. Fortunately, Pro-Byter — which printed out the directory in Figure 1 — groups these bytes together to make them more comprehensible.

You'll see in Figure 1, directly to the right of the file name E a single byte F which tells us the file type. ProDOS has made provision for a large number of file types; you can see the major ones in Figure 2.

File type \$19 (the file type of ADDRESS-FILE) is an Appleworks database program, while the SEEDLING file below is from the word-processing section of Appleworks. Apple has made provision for a whole range of file types, from Pascal to Binary ▶

and Integer BASIC, and there are even some types reserved for user definition.

The double byte following this — G — points to the file's first block. From this it can be seen ADDRESS.FILE starts at block \$0008 (reverse the byte order) on the disk.

BOFs and EOFs

This first-block pointer remains in the directory listing even though the file header shows the file is inactive. You will see this with the first of the YC.PRODOS directory entries below; it points to block \$0018 (note the YC.PRODOS is an Appleworks word-processing-type file, not a system file).

This means you can find the first block (which contains a directory of the other blocks) of a file that has been deleted — whether it has been deleted through deliberate action, or by re-saving the file to disk, as in this example.

The size of the file in terms of the number of blocks allocated for its use is shown at H. The ADDRESS.FILE takes up \$001E blocks (that's 30 blocks in decimal), while the seedling file below only takes up one block. If the word-processing document

File Type	Preferred Use
\$00	Typeless file
\$01	Bad block file
\$04	ASCII text file (SOS and ProDOS)
\$06	General binary file
\$08	Graphics screen file
\$0F	Directory file (SOS and ProDOS)
\$19	AppleWorks Data Base file
\$1A	AppleWorks Word Proc. file
\$1B	AppleWorks Spreadsheet file
\$EF	Pascal area
\$F0	ProDOS CI added command file
\$F1-\$F8	ProDOS user defined files 1-8
\$F9	ProDOS reserved
\$FA	Integer BASIC program file
\$FB	Integer BASIC variable file
\$FC	Applesoft program file
\$FD	Applesoft variables file
\$FE	Relocatable code file (EDASM)
\$FF	ProDOS system file

Figure 2. File types under ProDOS.

renamed SEEDLING was to be expanded and re-saved to disk, the number of blocks consumed would immediately jump to at least three, since the file would then become a 'sapling'. The new file header would change from \$18 to \$28, to indicate

this change in status.

The next group of three bytes I gives us information about the actual length of the file (as distinct from the number of blocks allocated to it, which includes index blocks in larger files). This information is useful for finding the end of the file.

This next bit is a little complex, but very important, so read carefully. Reading the hex bytes from the right and using the ADDRESS.FILE example again, this group of three bytes tells us the file is \$0038 sectors (note, 'sectors' or half blocks — not blocks) long, plus \$57 bytes. Counting starts from the first sector with formatting information. This gets a bit confusing because it doesn't always relate directly to the number of blocks allocated. Remember when you are using hex numbers you must always count from zero. Thus, \$00 is the first number in the sequence.

For instance, a seedling file can only occupy one block, and so Appleworks uses the first half block (Part A) for format information (tab settings, line-break information and so on) and the second half block (Part B) to actually store the text. The larger sapling or tree files reserve blocks for indexes as well.

The seedling file named SEEDLING therefore shows the end-of-file (EOF) marker is set at sector \$0001 (that is, the second sector), and will be found at the \$4Bth (75th) byte. Figure 3 shows the Pro-Byter printout of the block that makes up this seedling file. Pro-Byter gives us an ASCII translation in the left-hand column, and the actual bytes in groups of four, in the three columns on the right.

Figure 1. The volume directory block as seen by Pro-Byter. A is the hex number of the previous block; B is the block number of space allocated for the main directory extension; C shows the file type; D indicates the length of the file name; E is the file name; F tells the file type; G points to the file's first block; H is the space allocated to the file; and I is the actual length of the file.

A	B	C	D	E	F	G	H	I
00 00 03 00	F9 DEMO.DISK:1111	0000-0000 00 00 C3	2C ADDRESS.FILEEMP	19 0800 1E00 573800	00 0000 0000 000000	270D 0300 0600 1801		
	FCAC-0000 00 00 E3	7E70 FCAC-0000 0200						
	1B SEEDLINGKS.TEMP	1A 1600 0100 4B0100						
	FCAC-0000 00 00 E3	0000 FCAC-0000 0200						
	00 YC.PRODOSS.TEMP	1A 1800 1000 E01C00						
	FCAC-0000 00 00 E3	2000 FCAC-0000 0200						
	29 YC.PRODOSS.TEMP	1A 3700 1000 CC1D00						
	FCAC-0000 00 00 E3	2000 FCAC-0000 0200						
	00 ::::::::::::::	00 0000 0000 000000						
	0000-0000 00 00 00	0000 0000-0000 0000						
	00 ::::::::::::::	00 00						
BYTE	VALUE	A	BLOCK	PART				
44 (\$2C)	65 (\$41)	A	2 (\$02)	A				

Part A - Formatting Information.

[illegible]

Part B - Text.

[illegible]

Figure 3. Printout of SEEDLING file.

The bottom lines of the screen provide information on the file name, the cursor byte and block numbers, and whether this is Part A or B. The value category provides a translation of the byte under the cursor.

You can see in Figure 3, Part A is reserved for the formatting information. The ASCII translation shows a series of '|=====' characters which are actually the default TAB settings.

I haven't been able to work out fully what all these format bytes represent, and

the Apple documentation I have is obviously incomplete. It appears some of the bytes just contain random numbers with no meaning, so I'd be interested to hear from anyone with more information.

Figure 4 shows what the bytes in Figure 3 represent, reading down from the top of Part A (remember, this is an Appleworks word-processing file we're talking about).

Byte	Description
0 - 3	Not used
4	Always \$4F for some reason!
5 - 84	Tab stops
85	The zoom switch (boolean)
86 - 89	Not used
90	Are page-break lines showing (boolean)?
91	The minimum left margin (figured in tenths of an inch)
92 - 249	Reserved for later mail-merge facility
250 - 299	Left available for anyone to use.

Figure 4. Explanation of SEEDLING file listing.

At the bottom of Figure 4, we have started to describe the first couple of lines of Part B, with the file proper starting from the 300th character (although Appleworks calculates everything itself from the first character of the formatting bytes).

So although the example named SEEDLING only contains the words "I am a seedling file" it still occupies the best part of the whole block. The three-byte file-length group I in the directory tells us the end of the file will be on the second sector (\$0001), and counting from the first byte on this sector, we will find the first unused byte at position \$4B, which is the 75th byte (count the leading zero).

Okay, time for some maths:
 1 sector = 256 characters + 75 = 331
 then subtract 300. This suggests the text-
 file length is 31 characters, when in fact it
 is only the words "This is a seedling file"
 — 23 characters. Where do the other eight
 bytes come from?

Two bytes come from the \$FFFF end-of-file marker (EOF), and there are two bytes (\$001D0) which mark the last carriage return. Up front, there is an extra double byte followed by two single bytes in sequence — \$0019 \$00 \$97 (\$19000097) in the example. But before we look at these, let's clear up the problem of the end-of-file marker.

In Figure 3 you can see the ASCII translation has added a 'P' to the end. The 'P' is a high-byte translation of \$D0, which is the carriage-return byte. In this case, it

precedes the \$FFs at the end of the file, but you'll often find them scattered through the text.

Immediately before this \$D0 (carriage return) at the end of the file, is a byte \$00, which is used to indicate the horizontal screen position of the carriage return. It can obviously be any number below \$50 (80) for the normal 80-column screen.

Formatting Commands

Any byte higher than \$D0 (that is, from \$D1 to \$FF) is a formatting command. If the SEEDLING file were longer you would see some of these scattered through the text bytes, but since this file is only one sentence long, it doesn't need any. In the next part of this series I'll give you the main formatting translations for Appleworks word-processing files.

Now, let's return to the front-of-file sequence \$0019 \$00 \$97 (\$19000097). The first pair of bytes tells us the number of bytes that follow this hex word. Across an 80-column screen, this will be less than decimal 80 (hex \$50), so the second byte is actually superfluous. It's there for future expansion, and you can use it as an indicator of a text line.

The third byte (also \$00 in the example), gives the screen position of the first character; in this case it's right up against the margin. The fourth byte (\$97) is used as a 'flag' plus a measure. If you translate this byte to binary (1111 1001) you will find the first binary digit is used as a Boolean indicator to tell you whether there is a carriage return at the end of the line. A 1 indicates yes and a 0 no, with the remaining 7 bits indicating how many bytes of text follow this byte.

Appleworks stores a lot of formatting information within the text storage area itself using the above two pairs of bytes as 'bookends'. This will become more apparent when we deal with larger word-processing and database files later in the series. □

COMPUTER

Even for the serious computer user, computing is not always a straightforward business. When problems occur Computer Haven customers know they can trust us to get them on-line again. We have qualified technicians, experienced programmers, an expert technical team, and the fast reliable service that business needs. More than just a PC discounter, Computer Haven services and supports. For some very important people. Our customers. Call us today.

A SMALL PART OF OUR "PRINT OUT"

MODEMS

Netcomm	call
Nice Modem C64	\$299.00
Includes Viatel & BBS software	
Nice Modem RS232	\$279.00
Nice Modem IBM	\$359.00
Includes Viatel, terminal emulations, BBS software	
Nice Modem II	\$699.00
300, 1200, full duplex, 1200/75 Hayes compatible auto answer/dial	

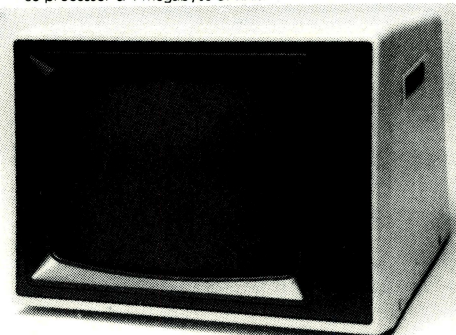
BUSINESS SOFTWARE FOR YOUR IBM

Complete PC tutorial	\$84.00
DAC Easy Accounting	\$190.00
DAC Easy Accounting (Australian)	\$249.00
Fielok encryption/decryption	\$99.00
Microsoft Chart	\$495.00
Microsoft Windows	\$225.00
Microsoft Word Version 3	\$875.00
Norton Utilities 3.1	\$155.00
Perfect Writer	\$407.00
Perfect Calc	\$299.00
Perfect Filer	\$295.00
PFS Write/Spell	\$255.00
PFS Report	\$295.00
PFS Graph	\$295.00
Sideways	\$95.00
Borland Superkey	\$107.00
Borland Turbo database toolbox	\$85.00
Borland Turbo Editor toolbox	\$92.00
Borland Turbo Gameworks	\$92.20
Borland Turbo Graphix toolbox	\$92.20
Borland Turbo Lighting	\$122.50
Borland Turbo Pascal W/8087 & BCD	\$145.00
Borland Turbo Prolog	\$139.95
Borland Turbo Tutor	\$55.00
VP Planner (Lotus work-alike)	\$225.00
Word Perfect V4	\$645.00
Timeline	\$725.00
Viatel Software	\$84.50
Supports Hercules card and telesoftware	
Symphony 1.1	\$1195.00

IBM HARDWARE

Dalson Colour/monochrome card	\$395.00
Supports monochrome or colour graphics output on a TTL screen	
Havenware Hercules clone	\$199.00
100% Hercules compatible!	
Havenware 512K card (with 384K)	\$237.50
Havenware Multi I/O card	\$182.00
Havenware Multifunction card OK	\$195.00
Includes serial, parallel, joystick, clock, extra serial port option, room for 384K	
Havenware Multifunction card 384K	\$338.00
As above, fully populated	
Havenware AT Multifunction card	\$377.00
Supports up to 1.5M of RAM	
Havenware print buffer card	\$208.00
Havenware parallel interface	\$70.00
Taxan KIF3800	\$599.00
640 by 400 colour graphics	
Sigma 400 with paintbrush	\$1175.00
Qubie EGA card with 256K	\$595.00
IBM AT style	\$129.00
IBM AT style extended keyboard	\$185.00
Havenware Mighty Mouse	\$155.00

Microsoft Mouse serial	\$349.00
Microsoft Mouse bus	\$349.00
Orchard PCTurbo 286e	\$1749.00
High speed accelerator with no wait state 80286 co-processor & 1 megabyte of RAM	



Superb quality, sharp resolution, and an unbeatable price. Havenware green and amber composite monitors suitable for Apples, IBMs and Commodores. Only 100 available at this price!

\$165

APPLE HARDWARE

Havenware 80 column card	\$93.60
Features soft-switching, inverse & Videx compatibility	
Extended detachable keyboard	\$179.00
Havenware Apple Fan	\$65.00
Apple II+/Ile lightpen card	\$165.00
Includes graphics software	
Autoice Ile extended 80 column card	\$99.00
Citech Flipper 1MEG memory card	\$716.00
Grappler Plus printer interface	\$56.00
Grappler Plus with buffer	\$155.00
Supplied with 16K buffer on board & cheaply upgrades to 64K	
Havenware 16K language card	\$78.00
Havenware PAL colour card	\$78.00
SAM voice card	\$55.00
Speech generation with software	
Taxan RGB card for II+/Ile	\$170.00
Taxan RGB extended 80 column card	\$385.00

APPLE SOFTWARE

Viatel software with telesoftware	\$84.50
Macwrite style word processor	\$129.00
Requires Ile or IIC	
Plusworks (allows Apple II+ to run Appleworks)	\$39.75
Plusworks XM (as above but with RAM card support)	\$89.95
Plusworks XM RAM PAK	\$199.00
Plusworks XM plus 128K memory	

MONITORS

Princeton HX12 colour monitor	\$799.00
Taxan Supervision III	\$825.00
Taxan Supervision IV	\$1170.00
Qubie HR134 amber	\$299.00
Qubie HR31/200 colour monitor 14"	\$730.00
Qubie HR31/350 EGA	\$925.00
Qubie HR39 green	\$299.00

Taxan KX-1212 TTL green	\$306.00
Taxan KX-1213 TTL amber	\$314.00
1901 IBM compatible RGB	\$550.00
Thompson hires RGB	\$799.00
Thompson composite green	\$210.00
Thompson composite amber	\$210.00
Thompson TTL green	\$295.00
Thompson TTL amber	\$295.00

DISK DRIVES & TAPE BACKUP

Apple Chinnon disk drive II+/Ile	\$225.00
Silent operation, direct drive	
Apple Chinnon disk drive IIC	\$270.00
Switching power supply	\$120.00
Tandon 20 megabyte hard disk	\$1195.00
Tandon 20 megabyte hard card BT-20	\$1395.00
Includes \$100 worth of directory management software free	
Tallgrass "Grasshopper"	\$1995.00
Tallgrass 80 megabyte internal	\$6999.00

PRINTERS

Brother M1509 180cps & NLO 15"	\$875.00
Brother M1109 NLO	\$499.00
(LX80 & IBM graphics compatible)	
Brother M1109 NLO for Apple IIC cables	\$499.00
Brother Twinwriter	\$45.00
Call	
Citizen MSP-15 160cps & NLO 15"	\$999.00
Citizen MSP-20 200cps & NLO	\$950.00
Epson LX86	\$575.00
Star NX10	\$489.00
Other star printers	call
Microline Okimate 20	\$599.00
Microline ML84 (500cps draft model)	\$1599.00
MSP 1000 Commodore/IBM compatible	\$549.00
Riteman C+	\$599.00
Riteman F+	\$699.00
Olympia NP 165cps Epson compatible	\$540.00
Quadram Quadjet colour inkjet	\$699.00

COMPLETE SYSTEMS

Call or write for quotations on:	
Toshiba 1500	Toshiba T1100
Olivetti M24	Olivetti M28
Olivetti M19	Olivetti M21
Olivetti M24SP	IBM PC/XT
IBM AT	HP Vectra
Adler P50	Adler P60
Zenith micro's & Apricot's call	

MEMORY CHIPS

4164 64K-bit RAM chip (each)	\$2.90
64K memory upgrade kit (9 chips)	\$26.10
41256 256K-bit RAM chip (each)	\$6.95
For Olivetti's, turbo mother boards, etc.	
128K IBM AT piggyback chip (each)	\$9.00

ACCESSORIES

Baud rate converter	\$99.00
Disk notcher	\$12.00
S550 3.5" disk storage container	\$28.00
Printer stand	\$29.95
Taxan KIF4308 print buffer	\$389.00
64K-256K external parallel	
*You must present or quote this advertisement to receive this special price.	

PRICES SUBJECT TO CHANGE WITHOUT NOTICE
ALL PRICES INCLUDE TAX UNLESS OTHERWISE STATED

HAVEN

One of the most outstanding successes in computer communications has just got better! The Australian made, Telecom approved, Super Modem communicates at 300, 600, 1200 or 1200/75 baud rates and supports both world standard (CCITT) and American (BELL) protocols, and now comes with a 12 month warranty. Add to that a built in telephone, intelligent design (no more dip-switches to fiddle with) and auto-answering!

COMMODORE VERSION

Comes complete with Viatel software and terminal software. Upload and download files, and emulates an 80 column screen via high resolution graphics!

IBM VERSION

Includes Viatel software now with Hercules graphics card and teledownload support, and terminal software. Upload and download ASCII, XMODEM, Viatel, or Kermit files, emulate mainframe terminals including the IBM-3101, VT-100, VT-52, TV-910/920, H-19 and more... Windows, colour options, special protocols, the works!

SPECIFICATIONS:

BELL 103, BELL 202, CCITT V21, CCITT V23 (Mode 1) 600 baud half duplex, CCITT V23 (Mode 2) 1200 baud half duplex with or without an equaliser, Videotext 1200/75 or 75/1200 (switched), Power supply and telephone included, Standard RS232C interface or connects to user port (Commodore version).

RS232 version:

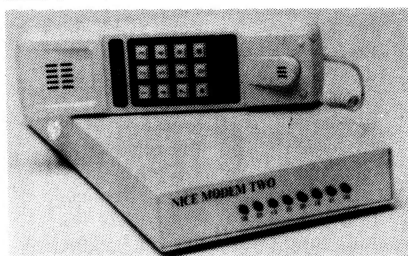
\$279

Commodore 64 or 128 version:

\$299

RS232 version with IBM software:

\$359



SUPER NICE MODEM II

What's HAYES compatible, auto-dial, auto-answer, 300 and 1200 baud full duplex, Viatel 1200/75 and 75/1200 compatible, supports BELL and CCITT, has auto-baud rate detection, microprocessor controlled "intelligence", a CMOS battery backed memory, built-in mini-computer style security features, comes with a great selection of software (as above) and costs \$500 under its nearest competitor? Our Nice Modem II!

(Note: phone hand set and Viatel software optional.)

\$699 inc. tax

THE COMPUTER HAVEN GUARANTEE

- **20 YEARS OF CUSTOMER SERVICE.** Five in the microcomputer industry. Which means, unlike some of our competitors, you can feel safe in the knowledge that you'll get what you ordered, and that you'll get it on time.
- **10 DAY RETURNS ON ANY HARDWARE!!** If you don't like any hardware product — for any reason — return it for a refund.
- **HUGE INVENTORY.** We're much bigger than any of the so called "computer warehouses". Your order will probably be dispatched ex-stock (subject to availability by the distributor).
- **THE PRINTOUT.** Customers receive our computer generated price bulletin which includes thousands of computer products and hundreds of unbelievable specials on all types of computer equipment, and our industry newsletter that lets you keep tabs on new products, new versions, and anticipated future pricing.
- **COMPUTER DISPATCH.** Orders are entered into, and processed by, our computer. You can contact us to check the status of your order at any moment.
- **SERVICE & SUPPORT.** Any company can claim service and support, but we have specifically employed qualified technicians, programmers and technical staff to help you via our hotline or electronic mail facilities. We're on duty Mon-Fri 9.00am to 5.30pm and Sat 9.00am to 2.00pm.
- **EXPERTISE.** Various publishers and editors have published over 100,000 words of what we've written internationally, and on every aspect of computing, from industry comment to microprocessor software design. Reputation is our highest concern.
- **OUR CUSTOMERS.** Needless to say, many of our customers are also acknowledged as the best in their respective fields. That's why corporations such as:
 - CCI
 - Caltex
 - TNT Bulkships
 - Wormald
 - Data Systems
 - Control Data
 - Driscoll
 - National Springs
 - Waugh & Josephson
 and government organizations such as:
 - AUSAT
 - The Australian Atomic Energy Commission
 - The Department of Main Roads
 - The Department of Lands, etc.,
 - CSIRO
 - Telecom
 - Australia Post
 - most universities
 and even the Premier's Department have purchased from us.
- **INQUIRIES.** We're also on Viatel. See our Viatel presentation on pages 2, 4, 8, 7, 5, 3 or contact us direct on *234923660#. If you have a 300 or 1200 baud modem you can log-on to our computer after business hours on our business number, and of course you're welcome to come into our Sydney computer retail outlet at any time.

(02) 349 2366

COMPUTER HAVEN

CONSULTANTS TO THE MICROCOMPUTER INDUSTRY

183 Maroubra Road, Maroubra Junction, N.S.W. 2035



Our Support Team



Software

Blast Error Transmission Corrector

Mini Computer Systems,
(03) 528 2711
Price: Not Supplied

A communications software package which eliminates wasted time re-sending corrupted files or blocks of data. BLAST (Blocked Asynchronous Transmission) is a powerful package that allows data communication between more than 100 different computers. Any machine with BLAST can talk to any other machine with BLAST. Useful in satellite communications where re-transmission is costly, BLAST re-sends any corrupted data simultaneously with the main data stream.

Carbon Copy Remote PC Users

Sourceware, (02) 411 5711
Price: Not Supplied

PC support professionals can control and monitor their long-distance user sites on-line using the Carbon Copy remote control package. Designed for the PC/XT/AT range it provides a link up between users which, once connected, makes the remote unit totally mirror the operation of the host and vice versa. Each user can see what the other is doing, allowing long-distance monitoring of operations, diagnoses, software support and a whole host of other functions.

Costcom Construction Costing

T.P.M. Construction, (02) 519 3407
Price: \$2700

Developed inside the construction business for effective control over crucial aspects of management, cash-flow projections, budget administration, orders, sub-contractors payments, client reports, justification of progress claims and memo-writing. Put together in conjunction with builders, it reflects its 'on-the-job' origins, and is menu-driven for easy use. Recommended hardware is MS-DOS with 640 Kbytes RAM, 10 Mbyte hard disk and colour monitor.

Dentics Package for Dentists

Sanyo Office Machines,
(02) 929 4644

Price: *Won't hurt a bit!*

Designed to run on Sanyo's MBC-755 with its in-built colour monitor, this package is set up as a workstation to sit beside the dentist, who can key in information to become part of the patient's record. The information is displayed as colour graphics, which can be explained to the patient. It provides automatic billing and takes care of other administrative and accounting tasks to enable the dentist to keep financial track of the practice. Open wide while I just slip in this disk!

Keytext Document Tracker

AWA Computers (02) 922 3300
Price: Not Supplied

Designed for operation inside the PICK operating system, Keytext is a system which automatically builds and maintains interactive on-line indices, enabling you to combine words and phrases to instantly retrieve relevant documents. Aimed at users who have a need to constantly search numerous files such as word-processing documents, reports, price lists, financial statements and even technical reports.

Lewis Letter Magic

Custom Made Software,
(02) 399 8566
Price: \$478

From Dr Geoffrey Lewis — who gave us Cross Cheque and Pay-Pack — comes a new gem called Letter Magic. It will enable you to write and print a complete standard letter with only five key-strokes. If you are writing a one-off letter, you start with the date, name and address immediately inserted. Full mail-merge and label-printing facilities are included. With only the commands needed to write short letters, it is easy to use and uncluttered with seldom-used functions.

New Educational Software for IBM JX

IBM Australia, (02) 923 5847
Price: Not Supplied

Three new educational packages developed by Active Learning Systems of Byron Bay, NSW, and marketed by Big Blue. Designed to both teach a subject and make computer-learning painless, the three programs are One World, Australia — A Profile, and Home-

town. One World makes the study of countries thorough and interesting. It has a database containing demographic, political, economic and geographical information about many countries which lets students gain a better understanding of similarities and differences in the human situation. Australia — A Profile was developed to encourage students to learn to use computers to analyse information, draw conclusions and facilitate the study of patterns of geography and demography in Australia. The data was compiled from the Australian Bureau of Statistics. Hometown assists students to undertake research into aspects of their local community. It provides a ready-made framework so students can store, analyse and compare information collected in field surveys. Areas include age, sex, occupation and housing. The package also provides for nine 'open fields' so students can store data specific to their local community.

New Hi-Tech C Compiler

Hi-Tech Software, (07) 38 3852
Price: \$250 (Z80),

\$300 (MS-DOS or CPM/86)

A new version (3.02) of the Hi-Tech C compiler with new features including much improved error handling and reporting. When a syntax or semantic error is detected, the source line containing the error is displayed and the point within the line at which the error was detected is noted. It is also possible to redirect the error message to a file or the printer. When generating assembler output, the C source lines are interspaced with the assembler code. Installation for hard disk is included.

Pass Key

Inteldata, (03) 878 7440
Price: \$49

A self-contained software package that unlocks the information you need to design password security for your programs, files and on-line operations. The software contains a tutorial on detection techniques, algorithms to test your codes and assign access difficulties, plus a stand-alone program that may be incorporated into existing software. For the Macintosh or IBM.

PC-Eighty CP/M to MS-DOS

FBN Software, (062) 86 1102
Price: \$120 including V20 chip. PC-Eighty allows users of CP/M 2.2 to run their old software on MS-DOS machines. Using NEC's V20 chip in place of the CPU chip (the only hardware change needed), it allows users to move their existing CP/M operating systems to their PC and run applications as a 'task' in the new environment. DOS-resident programs such as Sidekick can run under the system. The program allows for a full 64 Kbyte CP/M system with a RAM disk of up to half a megabyte, and optional use of a hard disk.

Softlogic Disk Utilities

SNS Leading Edge, (02) 958 2399
Price: \$120

Four new disk utilities from the US. Disk Optimiser, Cubit, Carousel and Double DOS. Disk Optimiser re-organises hard disks so all empty spaces are moved to the back of the disk and files are rearranged in the front of the disk. This increases the disk access speed. Cubit squeezes files before writing them to disk, then expands them before retrieval. It also works on cassette files. Carousel allows up to 10 application programs to be loaded and run simultaneously. Each time the user switches from one application to another (by simple key-strokes), Carousel unloads the current application from RAM into allocated storage space and loads the new one. Double DOS allows the user to run two software applications side by side. A background application such as printing a spreadsheet can continue while you work on a word processing file, for example. Buy all four utilities and get a discount.

Peripherals and Extensions

Hercules Graphic Card Plus

Sunshine State Scientific,
(07) 52 9522

Price: \$654

This new board dramatically speeds up the display of multiple

NEW PRODUCTS

fonts on the IBM PC, and enhances such applications as Lotus, Symphony and Microsoft Word using software drivers developed by Hercules. It uses a new hardware mode called Ram-Font, which combines the speed and simplicity of text mode with the flexibility of graphics mode. Ramfont enables software publishers to customise their programs and display multiple fonts as easily as older cards display monochrome text. With Ram-Font, Microsoft word can now display italics, boldface, superscript and subscript at the speed of text mode — more than four times faster than without. 24 fonts may be stored in RamFont including scientific characters, foreign-language characters and special graphics symbols. Described as an ideal tool for 'What You See is What You Get' appli-

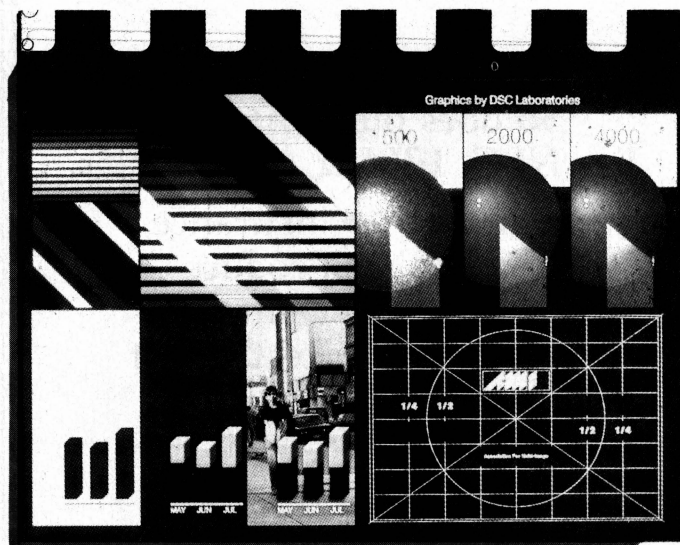
cations in in-house publishing. Character size may be varied from four to 16 pixels high and from eight to nine pixels wide.

High-Capacity Winchester Sub-system

Alloy Australia, (03) 561 4988

Price: Not Supplied

This high-speed, high-capacity hard-drive sub-system enables IBM PC/ATs to be instantly converted to network file servers. The ID-106's 125 Mbytes of storage has an average access time of a mere 30 millisecs, achieved through the incorporation of a rotary voice-coil actuator which guarantees error-free operation in even the most intensive disk-accessing activities. Disk caching provides further increases in retrieval speeds by enabling commonly used information to be held in memory.



Jdiskette

Minicomp, (02) 957 6800

Price: Not Supplied

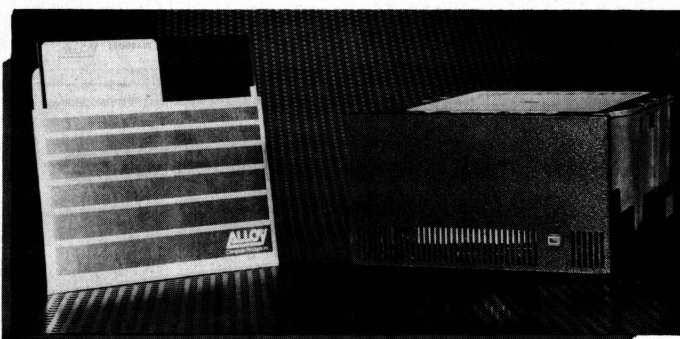
Jdiskette is a combination of hardware and software which turns your PC disk system into an AT system. The controller card replaces your current card and is designed to support dual speed 1.2 Mbyte drives. Jdiskette lets you format, read and write the IBM AT format on high-density diskettes and supplies all the software free.

Jlaser Plus

Minicomp, (02) 957 6800

Price: Not Supplied

Drive your laser printer at its maximum speed by by-passing the standard buffer and controller, sending data direct to the 'engine'. You'll be able to print full-page graphics of 300 dpi resolution with unparalleled speed. With Jlaser Plus, the computer can transfer 1.8 Mbits per second, bypassing the speed limitations of standard communications. An optional scanner interface cuts a standard page scan from 40 secs to 15.5 secs. Available in eight- or 16-bit models for PC/XT/ATs.



PC PROMISE

THE NEW STANDARD IN RELATIONAL DATABASE MANAGEMENT SYSTEMS

Promise is FAST...VERY FAST. Selects 20 records in 25 seconds
 Promise is compatible with W/Star, d BASE, Lotus 123 & Ascii files
 Promise is Linked Files up to 4 levels deep in relational format
 Promise is Windows & Screens. Design your own. Link screens.
 Promise is extremely flexible. Up to 250 fields per record.
 Promise is 4 files open at once. Can all be linked together.
 Promise is 32000 records in each file. Have many files.
 Promise is online help screens. Design your own!
 Promise is up to 16 field index and 48 characters
 Promise is Password protected- 5 levels. Your eyes only & others
 Promise is colour or mono. 16 colours or shades of grey.
 Promise is Menu driven. Design your own. Link together.
 Promise is able to add or delete fields without re-writing file.

from

THE PEOPLE-SERVING-PEOPLE MARKETING NETWORK

YOU'RE ON A PROMISE. Send us your \$250 now and try PC Promise. If you are not completely satisfied within 14 days, return the entire package in as new condition and we promise to refund your \$250 less a \$5 handling charge.....and.....THAT'S A PROMISE!

To AMSNET International Pty. Ltd (UK & Aust)

49 Riversdale Rd

OXFENFORD Q 4210 Phone 075-531734.

Telex AA43470 COWENS

Please send copies of PC Promise on IBM 5.25" disc
 Send information only on PC Promise to

Name Ph.....

Address

City/Town Postcode

Cash/Cheque for \$ enc. Bill my B/card, M/card, Visacard

No. Exp. Date.../.../...

Signed

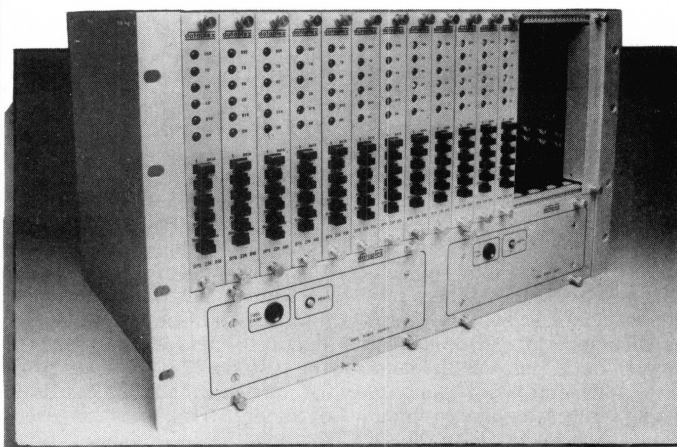


**Cairns means hassle-free living.
So does our Software!
For NEC, IBM & compatibles.**

- Finance
- Video
- Booking
- Aviation
- Schools
- Legal
- Real Estate
- Insurance
- Produce
- Dental
- Restaurant
- Fishing
- Farming

**CYPHER RESEARCH LABS.
P.O. BOX 4, MACHANS BEACH 4871
PHONE: 55 9138**

NEW PRODUCTS



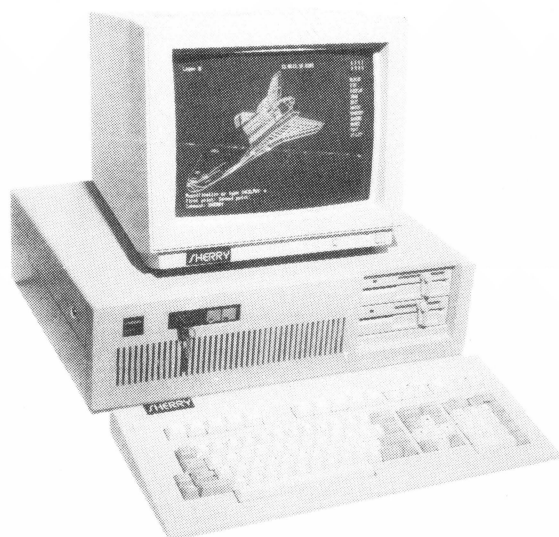
Modem Racking System

Dataplex, (03) 735 3333

Price: Rack \$1680, Cards \$1800

A racking system designed for applications requiring multiple modems. It offers a reduction in the number of lines and modems needed to support multiple-speed dial-up systems. The 16-slot rack features dual redundant

power supplies and is ideal for crowded computer rooms. It can handle all standard CCITT speeds from 75 to 2400 bps. The DPX-244, Australian built modem includes auto speed, auto dial, speed change, auto answer, Hayes compatibility, call timing, error correction and security callback.



\$2675
(Plus Monitor)
12 Months Warranty
(Delivery Free)

PC/AT COMPATABLE

- 1 MEG RAM
- 360K DRIVE
- 1.2M DRIVE
- 200W POWER SUPPLY
- AT KEYBOARD (84 keys)
- PARALLEL PORT
- RS232 PORT
- MANUAL
- 360K/1.2M DISK DRIVE CARD
- COLOUR GRAPHICS CARD

T.T.I. COMPUTERS

 **(03) 859 5920**



Dealer Enquiries Welcome

The new **Micro10** Perfect 286+ Compatible
features the Perfect Specs

Operating Speed: **10** MHz

Internal Hard Disk: **100** Mb

RAM Memory: **1000** Kb

Price: Way under **10000** \$

Software availability: Over **1000** packages

Compatibility: **100** %

Audited Performance ratio
against the ORIGINAL: **10**.3 times

The World's Perfect "10".

.. **Micro10** your Perfect choice of Business Computer.

KELLER
AUTOMATION



.. Ring Now

Dealers Wanted

MELBOURNE • SYDNEY • NEWCASTLE • BRISBANE
HOBART • ADELAIDE • PERTH • AUCKLAND

14 Whiteside Road, Clayton South, Vic 3169
Tel. (03) 543 7244. Tlx. AA31781 Fax. (03) 543 5230

NEW PRODUCTS

IRAM2

Minicomp, (02)957 6800

Price: Not Supplied

Available with either 512 Kbytes or 2 Mbytes of memory and the software drivers, this board takes the place of an additional hard disk for many applications, offering up to five times the speed of a hard disk. Driven by a program called Jetdrive and supported by Jspool for print spooling, it is designed to run under PC-DOS 2.0 or higher. Both software packages may be purchased separately.

Services

Manual-writing Service

Plato's Communication Services,

(03) 232 0493

Price: Varies

Good at writing the software but lack the pencil-pushing skills to compile a manual? Nicholas Romas of Plato's Communication Service may be able to help. Working closely with the programmer, Plato's will produce a software manual with a professional standard of editing and up-dating.



Rent A Plotter

Tech Rentals, (03) 879 2266 and in other capitals.

Price: Not Supplied

Hewlett Packard's HP7550A high-speed plotter has been added to the range of equipment available from Tech Rentals. Equipment of this nature is often beyond the reach of casual users and short- or long-term rentals could save you a bundle. Other such esoteric items as digitising oscilloscopes are available.



Videodisc Training

Syme Information Technology,

(03) 698 6353

Price: Not Supplied

The first Australian release of business training packages in interactive PAL videodisc, designed to run on IBM or compatible machines, linked to a videodisc player. The packages use computer graphics overlays on background video images. The first packages cover 33 subject areas including marketing and selling techniques, effective writing, interviewing skills and others.

Miscellaneous

Experimental 'Brain Chips'

AT&T Bell Laboratories

Not yet a product as such, but not far off. Currently under test in USA is a new design of chip called electronic neural networks (ENNs) — compact and, highly interconnected networks of many simple components, such as resistors and amplifiers. Like their living counterparts, these artificial 'neurons' function continuously and collectively to obtain quick answers. The most complex chip so far — 256 electronic neurons — contains 25,000 transistors and 100,000 resistors.

Fire-proof Cabinets

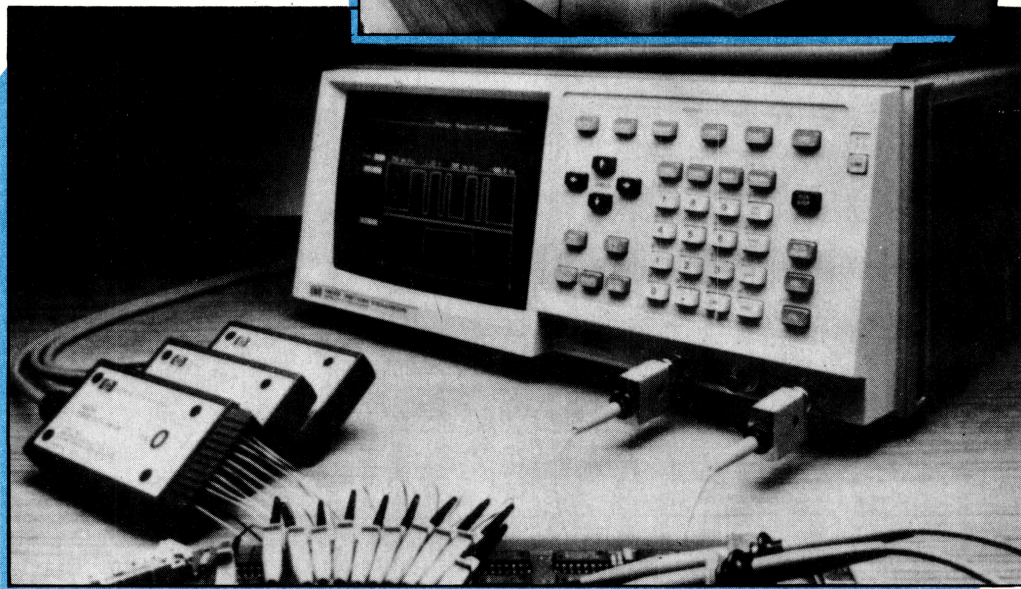
Chubb Australia Ltd (02) 699 3100

Price: Not Supplied

Described as the best thing next to your computer, the Chubb

CS090 Micro Cabinet protects floppy disks and other media not only from the most intense fires but also from dust, static, magnetic fields, humidity, unauthorised access, pilferage and acci-

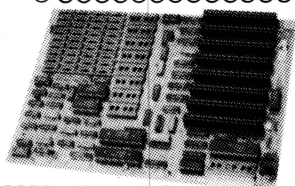
dental or malicious damage. Tested in Germany at temperatures of up to 1090 degrees Celsius for over thirty minutes, the inside temperature of the CS090 didn't budge past 30 degrees. □



The only PC products with a money back guarantee!

14 day money back Guarantee

All PC boards purchased from Electronic Solutions carry a full 14 day money back guarantee. If you are unhappy with any cards purchased from us, just return them in original condition with all packaging, within 14 days, for a full refund.



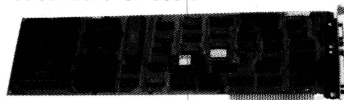
8MHz TURBO MOTHERBOARD

- 8088-2 running at 8MHz
- Turbo/normal (switch and software selectable) • Full 640K memory installed
- 4 channel DMA
- 8 expansion slots
- Keyboard port

\$450

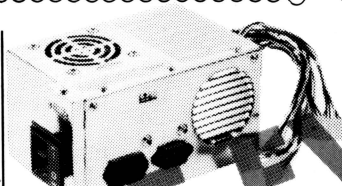
ENHANCED GRAPHICS/ PRINTER ADAPTOR (EGA)

- Can function as colour graphics, enhanced colour graphics, monochrome display and Hercules graphics card • 256K dynamic RAM screen buffer on-board



- Suits PC, PC/XT, PC/AT and compatibles

\$695



150W SWITCHING POWER SUPPLY

- For PC/XT and compatibles
- Outputs +5V/15A
- -5V/1A +12V/5A
- -12V/1A

\$136

FLOPPY DISK CONTROLLER



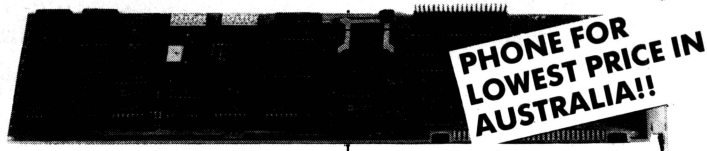
- Controls 4 DS/DD 360KB drives

\$65

SERIAL RS-232 CARD

- Independent receiver clock input
- 2nd serial port optional • Full buffering eliminates need for precise synchronization

\$55



TURBO SPEEDUP CARD

NEW

The old PC a bit too slow? You need our new 286 speedup card. Takes only one expansion slot and boosts performance over 6 times! • Allows PC and PC/XT to run the 80286-8 CPU, as used in the IBM PC/AT • 8088/80286 selectable • 80286 clock rate up to 8MHz • Separate 8088 clock for asynchronous operation • 512KB on board • DMA support • Socket for optional 80287

MONO GRAPHICS/ PRINTER CARD



- Hercules compatible • Interface to TTL monochrome monitor • 1 Centronics parallel port • 2K static, 64K dynamic RAM
- 2 page graphics: 720 x 348 resolution
- 80 characters x 25 lines
- Character box: 9 dots x 14 dots

\$165



I/O PLUS II CARD

- 1 serial port, 1 parallel port
- 1 joystick port
- Clock/calendar with battery backup

\$136



MULTI I/O CARD

- Floppy disk adapter, drives 2 DS/DD floppy drives • 1 serial port (2nd port option) • 1 parallel port, 1 joystick port
- Clock/calendar with battery backup

\$175

1.2MB/360KB FLOPPY CONTROLLER

- Supports both 1.2MB/360KB FDD • Fully PC/XT PC/AT compatible

\$145.00

1.2MB FLOPPY DRIVE

\$285.00
Or buy the pair together and save!
ONLY \$395.00

COLOUR GRAPHICS VIDEO CARD



- Suits RGB and composite colour monitor, TV set or composite monochrome monitor • Light pen interface
- Alphanumeric mode: 40 x 25, 80 x 25 • Hi-res black and white graphics 640 x 200
- Medium-res colour graphics: 320 x 200

\$115



512K RAM CARD

- 512K RAM installed (41256 chips)
- DIP switches to set RAM starting address

\$195

640K UNIVERSAL RAM CARD

- 640K memory installed (uses 4164 and 41256 chips) • User selectable options from 64K to 640K • Uses DIP switch to set RAM starting address

\$225

DISK DRIVES

40 track Mitsubishi Drive. Very fast track to track. Lowest price in Australia! SAVE!! 360KB DSDD.

\$245.00

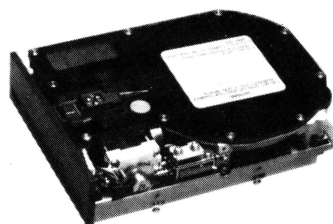
20MB NEC HARD DISK

Fast and super reliable. Brought to you at a fantastic Electronic Solutions price.

\$845

as above, complete with controller

\$1140



Still available at lowest prices

384K Multi Function card _____ \$295.00
Colour Graphics/Printer card _____ \$155.00
Parallel Printer card _____ \$44.00

ELECTRONIC SOLUTIONS

Electronic Solutions. PO Box 426 Gladesville. 2111
Phone (02) 427 4422. We accept both Bankcard and Mastercard.
Mail Orders our specialty. All prices include sales tax.

☒ We import direct and sell at low margins. You save.

☒ All products carry a full 3 month warranty

☒ Full documentation

MICROLAND

COMPUTER OPPORTUNITIES

SPREADSHEET

	New RRP	Our Price
Lotus 123	1054	\$CALL
Twin	283	220
Supercalc4	825	560
MS Multiplan	444	340
Javelin	1446	1320

DATABASE

DBase II	1043	700
DBase III+	1470	\$CALL
DBase III & LAN Pack	2085	1490
Paradox	1470	920
Q and A		\$CALL
Knowledgegeman 2		\$CALL
RBbase	1343	999
Reflex	285	220
Dataflex	1845	\$CALL

WORD PROCESSING

Gem Collection	360	270
MS Word	949	710
Multimate 3.31	1035	710
Multim/Advant	1209	849
Samna III	895	695
Samna Plus	1150	895
Spellbinder	903	695
Word Perfect	870	659
Wordstar	559	350
W'star 2000	833	499
W'star 200+	950	599
W'star Profln	833	499
XYWrite III	675	550

TRAINING

PC Tutorial	90	65
Professor DOS	111	111
TurboPascal Tutorial	90	65
123 Training	167	140

GRAPHICS

Gem Draw	450	360
Graph Talk	1195	1080
Harvard Presentation	833	570
MS Chart	648	499
Freelance	690	570
Formeasy Desk-Top	1198	850

PROJECT MANAGEMENT

Timeline	895	670
Harvard Tot. Proj. Mgr	1037	699
Super Project Plus	825	560
MS Project V.2	871	650

COMMUNICATIONS

Crosstalk XVI	285	180
Transporter Incl CrTlk	409	320
Softterm PC	464	430
Relay	375	320
Ascom	505	450

BORLAND PRODUCTS

Complete Range — Call for prices

DS Backup	
Fastback	
Copywrite	
Copy II PC	
Smartkey	
Superkey	
PC Alien	
Norton Utilities	
Art Gallery	
Sidekick (NCP)	
Trav Sidekick	
Systemate	
Typequik	
Newsroom	
Newsroom Clip. 1	
Newsroom Clip.2	
Printworks	
Printmaster	
Gateway	
Smartstuff	

INTEGRATED SOFTWARE

Framework II	1295	1020
Logistix	670	550
Open Access II	1260	\$CALL
Symphony	1470	999
Smart 3.0	1463	1180

ACCOUNTING

DAC Easy Acctg.	245	199
DAC easy Tutorial	49	40
Attache		\$CALL
Sybiz Plus		\$CALL
Olibiz	484	320
Info Business Mgr I	600	480
Info Business Mgr II	1075	850
Dollars and Cents		\$CALL

LANGUAGE

Lattice C	1015	880
Hi Tech C Compiler	360	300
Hi Tech Macro Assmb	300	250
MS Basic Compiler	893	670
MS C Compiler	1040	780
MS Cobol Compiler	1433	1080
MS Macro Assembler	444	330
MS Fortran Compiler	781	585
MS Pascal Compiler	669	510
MS Quickbasic Compiler	219	170
Clipper Compiler Dbase	1195	920

OPERATING SYSTEMS

Concurrent PC DOS 4.1	575	440
MP/M-86		\$CALL
Novell Netware	1995	1700

STATISTICS

Statpak	794	620
SPSS/PC	2110	1840

UTILITIES

New RRP	Our Price
210	160
250	210
130	92
115	89
81	68
165	120
104	82
185	140
56	50
155	115
150	115
150	98
	\$CALL
102	90
51	42
62	50
170	130
96	85
199	150
104	82

HARDWARE

Seagate 20M & DTC	1100
NEC 40M and DTC	2195
Tandon 21M and DTC	1240
Tandon 42M Voice Coil	2800
More than 42 Meg	\$CALL
Intel Above Bd PC	720
Intel Above Bd AT	940
Free 8087 with Intel Boards	
Hercules Colour card	270
Hercules Graphics card	430
Persyst BOB 16	860
Persyst Combo	540
Persyst SB 2	320
Persyst Supercharger	1200
AST 6 Pak Plus PC/XT	320
AST Advantage 128 AT	950
AST Advantage PAK	320
AST 6 PAK Premium 512k	920
AST Rampage PC/XT 256k	620
AST Rampage 512k AT	1140
AST Preview PC/XT	320
AST Prevu/6 PAK Combo	1020
Intel 8087	300
Intel 8087-2	\$CALL
Intel 8087-AT	490
Intel 80287-8	695
NEC V30 chip	\$CALL
KB-5151 Extended K'brd	220
KB-5160 AT-style K'brd	200
EPC-600 Printer cables	30
ESC-600 Serial cables	30
135w Power supply	220
360k Chinnon FDD	300
1.2M Chinnon FDD	420
KIF 4308 Buffer	435
KIF 64k Mem. expansion	70

CONSOLINK MICROPOOLERS

PP16	390
PP128	790
PSA6	395
SP16	410
SS16	430
SS128	840
256k Upgrade kit	125
64k Upgrade kit	60

INTERFACE CARDS

PI-001 Printer	70
RS-232C Serial	70
RS-232C w/clock	110
SPC-286 Ser/Par AT	160
MFB-384 Multi Fn	260
IOP-002 I/O card	160
DIB-541 Multi I/O	190
XT-286 Turbo card	750

PRINTER ACCESSORIES — BROTHER

HR15/35 Cut Sheet Feeder	460
HR35DD Cut Sheet Feeder	550
M1409 Cut Sheet Feeder	250
M1509 Cut Sheet Feeder	280
2024L Cut Sheet Feeder	460
HR15/35 Tractor Feeder	210
HR35DD Tractor Feeder	255
M1109 Tractor Feeder	45
1409/1509 Font and RAM	180

COMPLETE RANGE EPSON

PC's and PRINTERS
CALL FOR QUOTATION
CALL FOR QUOTATION

MICROLAND

BUSINESS MADE COMPLETE

(02) 331 7474

FOR PROMPT DELIVERY

DELIVERY EXTRA

WE DELIVER AUSTRALIA WIDE

170A Riley Street, Darlinghurst
P.O. Box 1221, Darlinghurst 2010.

Right opposite the Ansett Bus Terminal



MICROLAND COMPUTER OPPORTUNITIES

*SO RIGHT FOR SMALL BUSINESS SOLUTIONS, YOU'D THINK
YOU CONFIGURED THEM YOURSELF!*

OLIVETTI PACKAGE

Olivetti M28 CPU with 80286 chip, 8MHz operation, 1Mb memory, 1.2Mb FDD and 40Mb HDD. Incl keyboard & Olivetti colour screen, DOS & Basic, Oki ML294 400cps colour printer, with Database, spreadsheet and word processing software included.

\$13,200 complete.

BROTHER PRINTERS

HR10 Dual Port 12cps	495
HR15XL RS/CT 17cps	675
HR35 RS/CT 36cps	1395
HR35DD Twinwriter CT	2250
M1109/Dual 100cps	470
M1409/Dual 180cps	760
M1509/Dual 180cps	920
M2024L RS/CT 160cps	1499

Word Processing Stand-alone

Osborne PC, 640k memory, 360k FDD, 20Mb HDD, keyboard and Thomson high-res monitor plus Brother M1509 printer, and your software choice of Wordstar, Multimate, Samna or Spellbinder.

\$4,950 complete.

THOMSON MONITORS

Green/Amber Composite	230
Green/Amber TTL	260
Colour 14" RGB/VID	630
Colour 14" RGB	725
Colour 12" RGB/VID	810
Colour 12" RGB	870
Colour 14" 36311ID EGA	1040
EGA Adaptor card	30

OSBORNE

AT Compat & Printer

Osborne AT 80286 CPU, 6MHz operation, 1.2Mb FDD & 40Mb HDD. 512k expandable to 1Mb including Seikosha PB5420 420cps printer.

\$7,400 complete.

OKI MICROLINE PRINTERS

ML182 120/33cps 80 cl	465
ML183 120/33cps 136col	720
ML192 160/33cps 80col	775
ML193 160/33cps 136col	1020
ML292 200/100cps Colour	1150
ML293 200/100cps Colour	1450
ML294 400/100cps Colour	2200
ML84 200/50cps 136 Col	1340

NETCOMM MODEMS

	\$		\$
PC in modem	430	Smart 1234SA	1595
1200 in modem	720	Smart 1200A	749
2400 in modem	989	Smart 1200SA	889
123 in modem	1049	Smart 2400A	1055
1234 in modem	1300	Smart 2400SA	1190
Smart 123A	1249	Smart 2123A	552
Smart 123SA	1320	Smart 2123SA	599
Smart 1234A	1520	3 + 12 Auto	415

TAXAN MONITORS

Green TTL 18KHz	350
Amber TTL 18KHz	360
Green TTL 24KHz	440
Amber TTL 24KHz	440
Super Vision III	990
Super Vision IV	1280
KIF 545 CGA + HERC Compat	450
KIF 3800S RGB TTL CGA	540
Taxan 400 TGA CGA EGA	1260
KIF 4308 (printer buffer)	460
KIF 64k mem expansion	70

IRWIN TAPE BACKUP

10M Int for XT/AT	980
20M Int for XT/AT	1120
25M Int for AT	1120
45M Int for AT	1450
10M Ext for XT/AT	1320
20M Ext for XT/AT	1540
25M Ext for AT	1540
45M Ext for AT	1820
DC1000 Tape (per box)	280
DC2000 Tape (per box)	325

ADI MONITORS

Mono DM14 amber	\$295
Colour PX2 med-res	\$710
Colour PX4 med-hi	\$810
EGA PX22 super hi	\$1080

WYSE TERMINALS

Wyse 50	\$1295
Wyse 60	\$1460

OLIVETTI M24's

Dual FD 360k, 640k RAM, mono screen keyboard, bus, MS DOS/Basic. \$4400
20Mb HD, 640k, mono screen, k'board and bus, DOS & Basic. \$5100
M24SP 20Mb HD, as above yet with 10 MHz operation. \$5550



DELIVERY EXTRA

WE DELIVER AUSTRALIA WIDE

170A Riley Street, Darlinghurst
P.O. Box 1221, Darlinghurst 2010.

Right opposite the Ansett Bus Terminal

MICROLAND
BUSINESS MADE COMPLETE

(02) 331 7474
FOR PROMPT DELIVERY

Get a quote from your nearest Atari Dealer.

NEW SOUTH WALES

The Computer Place, BANKSTOWN	(02) 708 5843
Computerscope, BLACKTOWN	(02) 831 1718
Microcomputer Spot, BURWOOD	(02) 744 8809
Caringbah Computer Systems, CARINGBAH	(02) 525 5022
The Bit Shop, HURSTVILLE	(02) 579 1549
Calculator and Comp. Distributors, KELLYVILLE	(02) 629 2333
Chamber Computer Centre, KINGS CROSS	(02) 356 3155
Paris Radio Electronics, KINGSFORD	(02) 344 9111
Computers Galore, NEUTRAL BAY	(02) 908 2355
The Computer Place, NORTH SYDNEY	(02) 957 4690
Strategic Software, NORTHBRIDGE	(02) 958 3088
Computer 1, RANDWICK	(02) 399 8865
Computerwave, SYDNEY	(02) 29 1631
Downtown Duty Free, SYDNEY	(02) 221 4444
Downtown Duty Free, SYDNEY	(02) 233 3166
Microcomputer Spot, SYDNEY	(02) 221 1910
Venue Music Pty Ltd, SYDNEY	(02) 267 7288
Computech Computer Centre, BELCONNEN	(062) 51 2525
The Logical Approach, BELCONNEN	(062) 51 6349
Computech Computer Centre, BRADDON	(062) 57 1808
Dataland, ALBURY	(060) 21 8088
ABS Office Equipment, OURIMBAH	(043) 62 2004
BOA Computers, ORANGE	(063) 62 9422
Kurrawood Computers, RICHMOND	(045) 78 2377
Computer Wedge, WOLLONGONG	(042) 96 9966
Shop 4 Computers, WOLLONGONG	(042) 27 3927

QUEENSLAND

Alliance Computer Centre, ANNERLEY	(07) 892 1152
Southside Comp. Sales & Service, BEENLEIGH	(07) 807 2733
Execugames, BRISBANE	(07) 229 1891
Computer View, BUNDAMBA	(07) 282 6233
Computer Pro, CAPALABA	(07) 245 5122
Sundown Computer Centre, CHERMSIDE	(07) 350 3344
D.K. Electronics, GREENSLOPES	(07) 397 0888
Software '80, MILTON	(07) 369 6888
Datacom, BUNDABERG	(071) 71 4740
Computerworld, CAIRNS	(070) 51 2948
Wholesale Computers, COOLANGATTA	(075) 36 6722
Universal Services, DALBY	(074) 62 3228
Telair Electronics, SOUTHPORT	(075) 31 2302
Philtronics, MACKAY	(079) 57 8855
Computer Business Aids, MAROOCHYDORE	(071) 43 5849
Eltronics, ROCKHAMPTON	(079) 22 3446

VICTORIA

Maxwell Office Equipment, ABBOTSFORD	(03) 419 6811
Viatel Computers, BURWOOD	(03) 288 2144
Kinetron, DANDENONG	(03) 792 9094
PH Computers, DANDENONG	(03) 791 3129
Family Music, FOREST HILL	(03) 877 4737
The Local Computer Shop, GLENHUNTLEY	(03) 572 2156
Ultraphase Computers, GREYTHORN	(03) 857 4233
Calcitronics Pty Ltd, HAWTHORN	(03) 818 6631
Chamber Computer Centre, MELBOURNE	(03) 663 4441
City Toy World, MELBOURNE	(03) 663 4431
Myer, MELBOURNE	(03) 6 6111
Atlantis International Computers, MT. WAVERLEY	(03) 277 3139
Rampage Computers, SOUTH YARRA	(03) 241 3031
Sound Serious, TECOMA	(03) 754 6305
Bolton Brothers, BENDIGO	(054) 43 1455
Smiths Pharmacy, LEONGATHA	(056) 62 2837
Mildura Office Equipment, MILDURA	(050) 23 3611
B&B Computer Solutions, WANGARATTA	(057) 21 9145

WESTERN AUSTRALIA

Backgammon Shop, BELMONT	(09) 47 8115
Backgammon Shop, BOORAGOON	(09) 364 9430
Backgammon Shop, CANNINGTON	(09) 458 8846
Computer Oasis, CLAREMONT	(09) 384 8431
Peter J. Fox, FREMANTLE	(09) 430 4577
Shop 64, KALAMUNDA	(09) 293 3062
Norths Computer, KALLAROO	(09) 420 1302
Midland Computer, MIDLAND	(09) 274 4011
Backgammon Shop, MIRRABOOKA	(09) 349 9591
Backgammon Shop, PERTH	(09) 321 2932
21st Century, WEST PERTH	(09) 321 8902
Microbase Computers, WEST PERTH	(09) 328 9544
Wakes Music, ALBANY	(098) 41 4975

SOUTH AUSTRALIA

Myer, ADELAIDE	(08) 217 0123
The Computer Centre, ADELAIDE	(08) 223 6465
Metropole Business Machines, ADELAIDE	(08) 223 5538
Magnetex, FULLERTON	(08) 79 9951
Highbury Abraxas, HIGHBURY	(08) 265 4537
IBIS Computers, MEDINDIE GARDENS	(08) 344 9288
I.D.N. Computers, MILE END	(08) 352 7573
Cybex Computing, NORTH ADELAIDE	(08) 267 5855

 **ATARI** Technology so advanced, it's affordable.

Distributed and warranted by Mobex Pty Ltd.
Sydney (02) 406 6277, Melbourne (03) 329 5477,
Brisbane (07) 358 5366, Adelaide (08) 212 7455,
Perth (09) 328 3355.



Before you buy a Macintosh, get a few quotes.

"Without question, the Atari 520ST is the most advanced, most powerful microcomputer your money can buy."

CREATIVE COMPUTER, OCTOBER 1985.

"The Atari 520ST is a leading contender for the top position in the market, since it meets just about all the requirements of business."

AUSTRALIAN COMPUTING, JUNE 1986.

"The Atari 520ST is noticeably faster than the Macintosh, not only because of the faster clock-rate, but also because it has a faster disc-drive."

PERSONAL COMPUTER.

"The Atari 520ST is a formidable business system with the ease-of-use of a Macintosh, but at half the price."

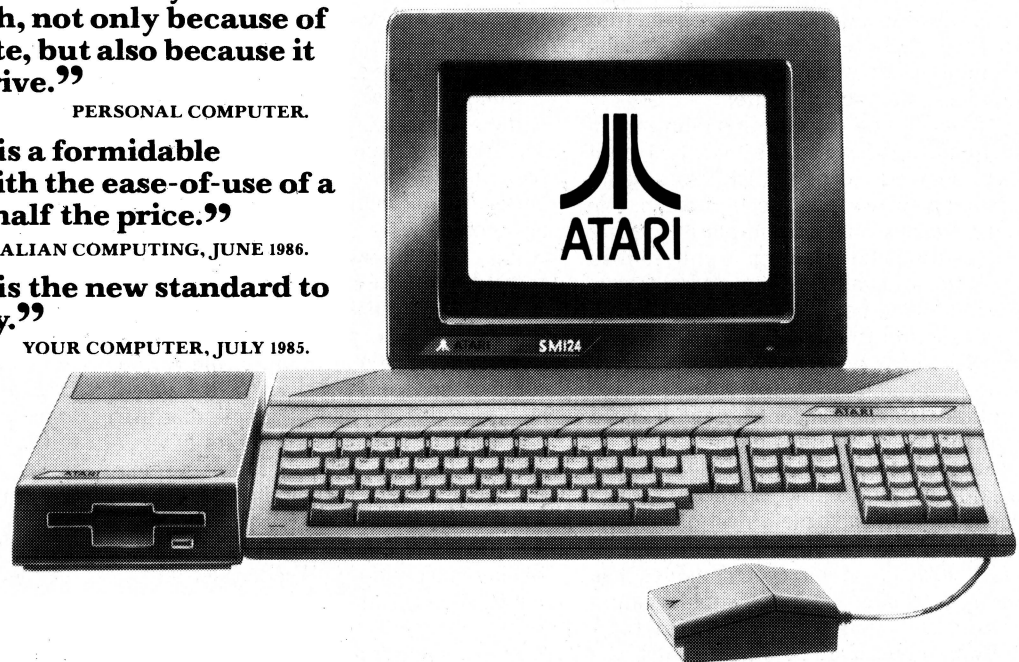
AUSTRALIAN COMPUTING, JUNE 1986.

"The Atari 520ST is the new standard to judge the others by."

YOUR COMPUTER, JULY 1985.

\$1895

520ST, SF 354 disk drive, mono monitor (colour option available), mouse, software-word processing graphics, basic and logo.



ATARI Technology so advanced, it's affordable.

Distributed and warranted by Mobex Pty Ltd.
Sydney (02) 406 6277, Melbourne (03) 329 5477,
Brisbane (07) 358 5366, Adelaide (08) 212 7455,
Perth (09) 328 3355.



MOB 1758R

Disk Drives

ONE OF THE annoying things about the C64 is its disk drive. The much maligned 1541 is painstakingly slow and prone to costly head mis-alignments. It does, however, have a couple of things going for it. Firstly, it stores 170 Kbytes of data — a respectable amount for a single-sided, single-density floppy. Secondly, it is the only drive on which 100 percent of C64 programs will work.

The latter is the main reason why Commodore is still able to find a healthy market for these drives, I suspect. The Skai and MSD alternatives are hampered by the fact the 1541 has proprietary ROM routines inside it. Their drives may emulate a 1541, employing the same DOS commands and track and sector layout, but copyright laws require their internal operating routines do not exactly duplicate Commodore's.

The subtle differences wouldn't be a problem were it not for the fact many software houses rely on quirks of the 1541 for their protection schemes. If you've ever used Easyscript you will have heard that famous 'knocking' noise as the program loads. This is part of Easyscript's protection scheme: hidden errors are written onto the disk and the loader program tries to read those errors. If it doesn't find them, it assumes you have a pirated copy and locks up your computer.

The only problem with this form of protection is it is hard on the 1541. Its inbuilt DOS responds to most disk errors by attempting to read that section again. The head crashes onto a base plate (to reset its position) and then steps out to re-read the error-causing track. It attempts this several times before it gives up and reports an error to the computer (the report the Easyscript loader is waiting for). Each time the head hits the base plate it is susceptible to a slight mechanical shift which may throw it out of alignment.

Easyscript was written in 1982 and uses a fairly simple form of protection. Since then we have seen the arrival of increasingly sophisticated piracy programs, and each advance in piracy techniques has brought an increase in the sophistication of the protection schemes. I suspect the software houses are fighting a losing bat-

Even Commodore's own 1571 disk drive, which is theoretically compatible with the 1541, will not load some of the protected 64 programs because of the ROM differences! The clear loser has been the average honest user. Our poor 1541s keep going out of alignment, and it's not just costly, but downright inconvenient having a drive in the repair workshop.

tle with all of this, but the clear winner has been Commodore, whose 1541 is the only drive which can run all the protection schemes, and thus, all the programs. Even Commodore's own 1571 disk drive, which is theoretically compatible with the 1541, will not load some of the protected 64 programs because of the ROM differences! The clear loser has been the average honest user. Our poor 1541s keep going out of alignment, and it's not just costly, but downright inconvenient having a drive in the repair workshop.

For all fellow sufferers, here's a tip which may save you trauma. One of the common sources of disk errors is caused by attempting to load programs that use half-tracks. Half-tracks are tracks halfway between the standard ones. After loading a program which uses half tracks as part of its protection, it's quite easy for your drive to end up stuck in 'half-track' mode. Even turning it off and on will not reset it.

If your drive is issuing lots of READ and WRITE errors, this could be the problem. Before sending it in for repair, try format-

ting a disk without having a disk in the drive. You can do this by typing:

```
OPEN 15,8,15:
```

```
PRINT#15,"NO:NAME,ID":CLOSE15
```

The drive will make a bit of noise, but that's because it's encountering errors (no disk inside it), and each error is causing it to reset itself. You are trying to knock it out of 'half-track' mode. I actually got this tip from someone who fixes out-of-alignment 1541s. He reckons 'half-track' errors cause about 50 percent of 1541 head mis-alignments. On his advice I tried it when my own drive went wonky and it worked beautifully!

The 1201 Monitor

Most users who upgrade to a 128 eventually want a monitor which works in 80-column mode. The colour monitors start at around \$400, but since there is little software exploiting 80-column colour, you would be wise to consider a monochrome monitor. You can use these in both 40- and 80-column modes, and the cheaper ones are quite affordable.

I'm using a Commodore 1201 amber monitor as I write this. It costs around \$200 and is perfectly adequate for most purposes. It suffers a little due to its compensating circuitry which limits its total brightness. Because of this, it works best with dark border, dark background and bright text; if I make the border bright, the text dims. I use it for 80-column word processing and 40-column telecomputing and I'm quite happy with it. It's also light and easy to carry about, with the 128D in my other hand.

There are more expensive monochrome monitors about, and I'm sure some of them improve upon the 1201, but it's really a question of horses for courses. One thing I have noticed is Microbee Systems sells a monitor that looks identical to the 1201, except it has a built-in 12-volt power output and no provision for a loud-speaker. It's a fair bet both monitors originate in the same factory, so performance should be identical. If you can live without the sound, you'll find the Microbee monitor is considerably cheaper, retailing at \$140 for a green screen and \$150 for amber. □

**THE IMPORTERS OF MACE \$153, XTREE \$112,
AND FORMTOOL \$295**

introduce



**DSBACKUP + is an invaluable hard disk software utility
designed to quickly backup and restore any or all files
from an IBM PC/XT/AT or close compatible**

FEATURES

NOT COPY PROTECTED

This means you can install it and forget it, with no need for clumsy key disks.

TRUE DATA COMPRESSION

Now you can get even more data on each disk or cartridge — up to 40% more!

SPEED

No more waiting around — DSBACKUP + backs up to 10 Megabytes in 5 minutes with its new SPEEDBACK OPTION!

MULTIPLE VOLUMES

You can now backup and restore from more than one drive at a time,

DIRECTORY & FILE SCROLLING

Now you can scroll through all the selected backup files prior to the backup process and take full advantage of the Inclusion/Exclusion FILESPEC capabilities.

PERCENTAGE COMPLETION

DSBACKUP + is always updating your screen with information regarding the status of your backup.

***INSURANCE YOU SHOULD
NOT BE WITHOUT!***

BENEFITS

DS BACKUP + IS SAFE

All the data you spent years accumulating is automatically verified while backing up and/or restoring, assuring you complete data integrity.

DS BACKUP + IS FAST

An entire 10 Megabyte hard disk can be backed up in 5 minutes (**That's 10 times faster than DOS**). Under normal operating procedures you will save valuable hours every time you back up.

DSBACKUP IS EASY

Completely menu or command line driven, all of the programming functions are clear and simple to follow during step by step backup/restore procedures. All the information you need is always on screen including single keystroke context sensitive help.

DSBACKUP + IS POWERFUL

With DSBACKUP + 's new power features such as True Data Compression and Data Specific Backups, DSBACKUP + offers options that were formerly only available on more expensive tape drives and mainframe systems.

ONLY \$195

PERFECT INTERFACE (AUSTRALIA) PTY. LTD.

Level 8, 56 Berry St., N. Sydney NSW 2060 Phone (02) 957 6686

Please send me _____ copies of MACE, \$153 each.

Please send me _____ copies of XTREE, \$112 each.

Please send me _____ copies of FORMTOOL, \$295 each.

Please send me _____ copies of DSBACKUP +, \$195 each.

I enclose my cheque for \$ _____ or please debit my American Express, Diner's Club, Visa, Mastercard or Bankcard plus \$6.50 freight.

----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------

Card expires _____ Signature _____

Name _____ Phone No. _____

Address _____

Company _____

Computers with more kick... and FREE software to boot!

High standards make the new DSE Multitech range more than IBM compatible... we believe they are superior!

Even with FREE software, worth hundreds of dollars, DSE Multitech costs considerably less than the equivalent IBM.

With the power-house PC 900 you receive the integrated program, **Open Access 2:** • word processing • powerful spreadsheet • data base • communications.

Its huge 20Mb hard disk drive and 1.2Mb floppy disk system tackles high volume data processing and networking systems with ease.

Operating 10 times faster than the IBM PC and nearly twice the speed of the highly regarded IBM AT*, there's no limit to the possibilities in your office.

The versatile PC 700 is exceptional value with the user-friendly Microsoft Windows/Mouse pack.

Accounts, word processing or spreadsheet are just some of the uses to which the 640K memory PC 700 can be applied.

A unique selectable operating speed nearly doubles processing time to 8MHz to make short work of long data runs.

The **Microsoft Windows/Mouse** pack eliminates complicated keyboard command entries with simple on-screen 'point-and-press' action for access to all functions.

And for small business or the advanced hobbyist there's no better value than the PC 500.

With models ranging from 256K memory and single disk drive, right up to 512K and 10Mb hard disk drive, you're up there with the 'big boys' at an affordable price.

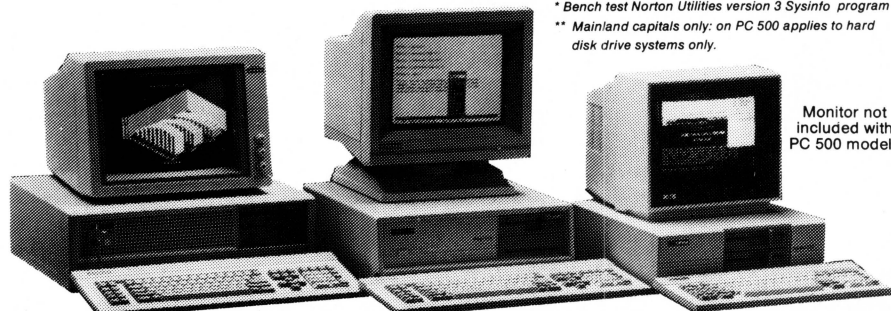
We include the new integrated program, **First Choice**, which contains most of your business needs: • word processing • spreadsheet • data base • communications.

Even if you require other business programs or specialist software, DSE Multitech's MS-DOS operating system is your passport to an extensive range.

Free Installation and on-site servicing

Added savings that make the difference between Dick Smith Electronics and other companies. Professional installation in your premises that puts you on line sooner. And if you should encounter teething problems, we'll rectify them without charge for the first 6 months**.

* Bench test Norton Utilities version 3 Sysinfo program
** Mainland capitals only: on PC 500 applies to hard disk drive systems only.



Monitor not included with PC 500 models

DSE Multitech PC 900

\$6995

Cat X-8115

- 1.2Mb floppy disk drive
- 20Mb hard disk
- 512K CPU — dual speed
- 14" mono monitor, cable & swivel base
- Serial and parallel ports
- MGA card — Hercules compatible
- DOS 3.1
- Open Access 2 software
- 6 month warranty
- 6 months on-site service **
- Free installation **

DSE Multitech PC 700

\$4595

Cat X-8107

- 360K floppy disk drive
- 20Mb hard disk
- 640K CPU — dual speed
- 12" green screen monitor, cable and swivel base
- Serial and parallel ports
- MGA card — Hercules compatible
- DOS 3.1
- Microsoft Windows and Mouse software
- 6 month warranty
- 6 months on-site service **
- Free installation **

DSE Multitech PC 500

from \$1395

System 1 Cat X-8000

- 360K single disk drive
- 256K RAM — DOS 2.11
- Composite video card
- Serial/parallel ports
- 3 months warranty

System 2 Cat X-8001

- 360K dual drives
- First Choice software
- DOS 2.11
- 256K RAM
- 6 months on-site service **
- 6 month warranty **

DICK SMITH ELECTRONICS

COMPUTERSTOP

• NSW • Albury 21 8389 • Bankstown Square 707 4888 • Blacktown 671 7722 • Blakehurst 546 7744 • Bondi Junction 387 1444 • Brookvale (Warringah Mall) 93 0441 • Campbelltown 27 2199 • Chesham Chase 411 1955 • Chullora 642 8922 • Gore Hill 438 5311 • Gosford 25 0235 • Hornsby 477 6633 • Liverpool 800 9888 • Maitland 33 7866 • Miranda 525 2722 • Newcastle 61 1896 • North Ryde 88 3855 • Parramatta 688 2188 • Penrith 32 3400 • Railway Square 211 3777 • Sydney City 267 9111 • Tamworth 66 1711 • Wollongong 28 3800 • ACT • Frimley 80 4944 • VIC • Ballarat 31 5433 • Bendigo 43 0388 • Box Hill 890 0699 • East Brighton 582 2368 • Coburg 383 4455 • Essendon 379 7444 • Frankston 783 9144 • Geelong 43 6522 • Melbourne City 57 9834 • Richmond 428 1614 • Springvale 547 0522 • QLD • Brisbane City 229 3577 • Buranda 381 6233 • Chermide 558 8255 • Redbank 268 5588 • Rockhampton 27 9644 • Southport 32 9663 • Toowoomba 38 4300 • Townsville 72 5722 • Underwood 341 0844 • SA • Adelaide City 232 1200 • Darlington 296 8977 • Enfield 260 8088 • Salisbury 281 1583 • WA • Cannington 451 8666 • Fremantle 335 9733 • North Perth 328 6944 • Perth City 481 3261 • TAS • Robert 31 0800 • NT • Stuart Park 81 1977

Want to know more? Send for your FREE information pack. It's obligation free.

☐ DSE Multitech

Name _____

Address _____

Postcode _____ Phone _____

Drop into any DSE store or post to: **B.306/JA**
P O Box 321, North Ryde, NSW, 2113. Phone (02) 888 3200

A FEW QUESTIONS have been asked about the PAMS Registry, so to clear up any misconceptions regarding how it is run, and why, a quick summary follows.

The Registry has been formed to provide a central point for all bulletin boards to be listed, along with their system details. It is run by me, and the running costs (stationery, postage and so on) are paid for by AED.

The lists are available to anyone; David Lutz from Teledata, for example, has arranged for the PAMS area there to receive the registry files (I get the pleasure of uploading them).

All that means is that, as long as all the system operators co-operate, we will eventually have a real-up-to-the-minute (well almost) PAMS list that everyone can and should use.

In case you'd like the lists, but don't want to download them, Select Software (see the company's advertisement in this issue, for details on how to order) has added the PAMS list disk to its public domain software library; ask for disk number CP107 (for CP/M) or M107 (for MS-DOS). Select Software will get monthly updates from the registry.

Because the Hi-Soft RIBM has shut down, the registry in Melbourne will now be looked after by John Blackett-Smith, sysop of The National FIDO BBS, with Rowan Stevens helping to keep tabs on the Melbourne systems (*Thanks guys!*).

The sysop of the Brisbane registry, Hi-Tech BBS' Clyde Smith-Stubbs, went to the United States just as the registry sent out the first dispatch, so by now the files should be available for access in sunny Queensland.

Don Crago and Grayham Smith of The Electronic Oracle, are looking after South Australia; and Graeme Platt of NEMO is keeping an eye on the Western Australian front (are we going to keep the Cup, Graeme?).

Crosstalk XVI —

Fix that Answer Back

Prophet and other Systems send out a ^E (ENQ ASCII character) when the system is ready for you to enter your name. Crosstalk and other terminal packages respond to this by sending a preset string of characters.

Using the defaults in Crosstalk ends up with a log-on name of 'Crosstalk — XVI John Smith', which isn't very effective and generally results in deletion of your log-on account when the sysop sees you.

There are two ways to fix the problem,

set the ANSBACK option to off (page 51 of the Crosstalk manual) or set function key # 4 to your real name. Just a reminder — save the options or you'll have to remember to clear the thing every time you use Crosstalk.

Security

One of the things that never ceases to amaze me is the way a normal (read sane, but then computer people are all nuts)-person logs on to a bulletin board system and proceeds to tell all and sundry what equipment they have. If we translate this into real life, it could be likened to walking down the street and telling a total stranger what computer you have, where you live, the PIN to your bank account, and giving them the key to the door!

Be careful. Most boards, including Prophet, require you to register by giving a name, address and contact phone number for use by the sysop. Some boards, including Prophet, allow you not to have your suburb displayed on-line, and even allow you to use a pseudonym when accessing the system.

This doesn't mean you can't enjoy using all bulletin board systems, just exercise a bit of common sense, and remember to keep a record of your computer details (serial/model numbers), in case you are unlucky enough to be robbed. Also, make sure you are insured — it might not look like much, but wouldn't it be costly, if not impossible, to replace?

PAMS List Updates

ACT

■ The Professional Computer Users' Group Inc (PCUG): phone (062) 58 9967; supports all baud rates; runs 24 hours, seven days; FIDO access — Mem/LVA; sysop is Alan Salmon.

New South Wales

- Adventure Line C-64 BBS: phone (02) 636 9027; weekdays 2200-1700, Reg/VA; weekends 2200-0800.
- Australian Connection BBS: phone (02) 625 4418; 24 hours public access.
- Blackboard TBBS: phone (02) 526 1343; 24 hours, Reg/VA; sysop Will Black.
- Freecomm C-64 BBS: phone (02) 525 0051; 24 hours, Reg/VA.
- Realtors FIDO-Net: phone (02) 387 5335; 24 hours; V22 B103, 212.
- Renegade FIDO-Net: phone (02) 631 2715; 24 hours; all baud rates; sysop Sam Sarkis; public access.

Corrections:

Abcom RIBM supports V22 (1200 baud).

CCUA C-64 BBS now requires membership.

Computer Connection hours are Week-days: 1700 — 2100; 1600 Saturday through until 0900 Monday.

Frontier Systems now running FIDO and supports V21/22/23 B102/212.

Palantir C-64 BBS supports V21/22/23.

Sentry now runs FIDO and is Mem/VA

Name changes:

Hackers Haven C-64 now Fantasy C-64.

Off-line:

Appletech — Status unknown.

Irata BBS — Status unknown.

Victoria

- ABE: phone (03) 288 3599; 24 hours; V21/22; public access; sysop Richard Gardiner.
- ABBACUS: phone (057) 83 1964 — details unknown.
- Atlantis RBBS-PC: phone (03) 277 6824; 24 hours; public access; sysop John Edwards.
- AUSOM: phone (03) 877 1990; 24 hours; public access; sysop Grahame Willis.
- C-64 BBS: phone (03) 489 4555; 24 hours; public access; sysop Alan Miles.
- Colour C-64 BBS: phone (03) 579 2147; 2300-0800 daily; public access; sysop Alard Eales.
- Commodore Board: phone (03) 875 1023; 2200-0800 daily; public access; sysop Keith Jarvis.
- Macboard BBS: (03) 435 9152; 24 hours; V21/22; public access.
- Microlink: phone (03) 233 0230; details unknown.
- Public Resource: (03) 690 7220; 24 hours public access; sysops D. Harvey, W. Clarke and R. Nagy.
- Termicomnet: phone (03) 589 1692; 24 hours; public access.
- Thunder-Net Amiga: phone (03) 791 1124; 24 hours; public access.

Corrections:

Microbee RCPM: phone (03) 82 1571; sysop Mike Thompson.

Off-line:

Hi-Soft BBS — Permanently shutdown.
Melbourne PIE BBS — Status unknown.

Queensland

Correction:

Brisbane Microbee Users' Group Bulletin Board (BMUG-BBS): phone (07) 38 4833; V21; 24 hours daily; public access; sysop Graham Scott.

Please report any changes or new listings to: Australian PAMS Co-ordinator, Prophet Bulletin Board, PO Box E41, Emerton 2770. Electronic address: ACSnet prophet@runx; Teledata prophet; BBS (02) 628 7030. □

STEMSOFT

*Buy first quality Australian software direct from the Developers
at low, low prices — for the Apple //* family of computers*

STEMWRITER

*'Excellent value for
money' — Your
Computer, May 1986*

- * ON-SCREEN underline, super & subscripts, over-strike, bold, auxilliary characters such as Greek alphabet.
- * MULTIPLE DOCUMENTS in memory & SPLIT-SCREEN viewing
- * WIDE documents and tables — up to 240 characters wide
- * COLUMN move/copy/ wipe & alignment
- * FORM LETTERS & LABEL printing
- * LIST MANAGEMENT — mail-list, standard paragraphs, references: SORT & SELECT
- * INTERACTIVE page preview
- * Footnotes, Multi-column printing
- * Background printing, print nominated pages.
- * Much, much more (See FREE Brochure)

STEMSPELLER



- * Automatically checks Stemwriter, Appleworks, Zardax & ASCII files
- * Uses Macquarie Dictionary as resource dictionary
- * 30,000 words which you can alter
- * Ability to add a further 3000 words of your own
- * Fast and easy to use
- * Needs only a single pass through a file

STEMFONTS

- * You can design and download your own character sets to suitable dot matrix printers
- * Already configured with Greek alphabet
- * Permits you to match Stemwriter screen display to printer output

* not the Apple //+

ORDER FORM

ITEM	PRODUCT	QTY	PRICE	TOTAL
1	STEMWRITER		\$130	
2	STEMSPELLER		\$50	
3	STEMFONTS		\$30	
4	ITEMS 1 TO 3 INCLUSIVE		\$195	
5	TNT AIR		\$7	

TOTAL ORDER

NAME
 ADDRESS POSTCODE
☐ CHEQUE ☐ MONEY ORDER ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
☐ BANKCARD ☐ MASTERCARD
 SIGNATURE

POSTAL ADDRESS: **STEMSOFT, GPO BOX 1280
BRISBANE, QLD 4001**

STREET ADDRESS: **31 CHISWICK RD, BARDON, QLD. 4065**
PHONE (07) 369 1515

NOTE: FREE Brochures available on Request. Software Packages available DIRECTLY from STEMSOFT ONLY.

Apple & Appleworks are registered Trademarks of Apple Computer Inc. Zardax is a registered trademark of Computer Solutions.

Lewis LETTER MAGIC

Lewis LETTER MAGIC helps you run your office more efficiently by greatly reducing the time spent writing letters, or finding information. But look what else it can do for you.

With two key-strokes

You have written this much of your letter:

July 16, 1986

Mr J K Smith
Marketing Manager
XYZ Engineering Pty Ltd
G.P.O. Box 12345
Sydney NSW 2001

Dear John

With five key-strokes

You can produce a standard letter as quickly as your printer can print it.

- **More than just a word processor, LETTER MAGIC includes a powerful database that lets you merge individual details into bulk mailings.**
- **Produce address labels, reports, simple invoices and much much more.**
- **Easy to master as the word processor only includes those commands needed to write letters.**

Ideal for sales, customer maintenance, clubs & any office that writes letters.

Price is \$399.00 + Tax.

EASY-TO-USE

All programs are designed to be used by people with no computer training. At all times, 3 lines of the screen are devoted to instructions of what to do next.

DEMO KITS

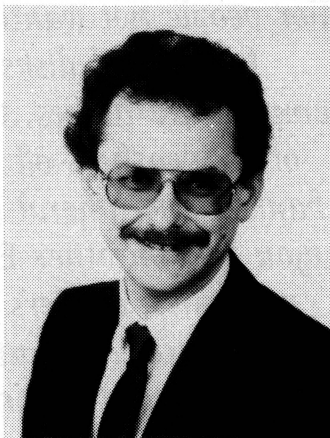
For each program you can order a demo kit, comprising the manual and a disk allowing you to test all aspects on your own computer. The cost can be credited to purchase price, within a month.

The programs are available for IBM PC, XT, AT and compatibles and most other MS/DOS and CP/M80 computers.

CUSTOM-MADE SOFTWARE PTY LTD

P.O. Box 507 Randwick NSW 2031

Tel (02)399-8566



Dr Geoffrey Lewis has established a reputation for producing highly innovative easy-to-use application software for micros. He has written top-selling packages for payroll (PAY-PACK), cashbook (CROSS-CHEQUE) and medical accounting (CASEG).

"LETTER MAGIC is my most innovative product. My other packages have taken fresh approaches to activities which everyone knew could be computerised. With LETTER MAGIC I have automated the production of letters. Each user will continue to discover new uses for this program for months and years."

TRACK YOUR INCOME & EXPENDITURE

Lewis CROSS- CHEQUE

"If ever there was a small software accounting system that could be described as ideal for the very small business, Lewis Cross-Cheque would fit the bill."

Dan Lawrence, reviewer for Your Computer, August 1986.

- Improve your financial control by getting reports about your business at the press of a button.
- Reduce your time spent on preparing your accounts and income tax return.
- Replace your cash book.
- Multiple cheque accounts.
- Bank reconciliation.
- Price is \$280.00 + sales tax

CROSS-CHEQUE IS IDEAL FOR

organisations unsuited to general ledger accounting such as

Doctors	Family Businesses
Shops	Real Estate Agents
Farms	Service Industries
Dentists	Motor Industry, etc.

Lewis PAY-PACK

PAYROLL SYSTEM

- Used by more than 200 Australian businesses in over 35 industries. Customers range from firms with 3 employees through to BHP.
- Includes management of sick and holiday leave.
- Price is \$690.00 + sales tax

To: Custom-Made Software
P.O. Box 507 Randwick

Send more information

Send demo kit

Send full system

Name:

Address:

Telephone:

LETTER
MAGIC

☐

☐

☐

\$36

CROSS-
CHEQUE

☐

☐

☐

\$36

PAY-
PACK

☐

☐

☐

\$60

Computer:

*For people not wanting to
hang hard disks,
temperature probes, turtles
or dishwashers off the
banks of peripheral ports
you find on other BBC
machines, it offers an
economical alternative
which might be hard to
pass by.*

The Baby Beeb

I'D HOPED TO play with Lego again this time, but the arrival of the Baby forced a postponement. I suppose I'll get used to calling the new Beeb the Master Compact, but at the moment that sounds more like the result of mating a small American car with a CD stereo system. Such is progress.

For a cut-down version of the BBC Master, it certainly has more features than we were led to believe: if a word-processing system is your main requirement, it would be excellent value with View 3.0 as well as the 640 Kbytes-per-disk Advanced Disk Filing System. By any standard View 3.0 is a great word processor, which now really is — dare we say it? — free of bugs and bad habits. There's also the ABC word processor for beginners. Although unnecessarily gimmicky, it would probably be popular with sub-teenage users.

For people not wanting to hang hard disks, temperature probes, turtles or dishwashers off the banks of peripheral ports you find on other BBC machines, it offers an economical alternative which might be hard to overlook. The RS232 port (not RS423, note) will allow you to connect goodies like modems, plotters, serial printers or whatever takes your fancy, and the normal Master's Econet upgrade will make it a very attractive machine to those not needing all the features of the Master ET. Naturally a parallel printer port is supplied as standard.

The Compact's BASIC 4 has been upgraded to run even faster than the standard Master's. What you don't get are the user port, 1 MHz bus, DFS, Tube, cassette, clock, analogue port or UHF video. The last is certainly no great loss, but the lack of a user port will prevent the use of the Lego interface, Concept keyboards and so on, unless peripheral manufacturers come good with the appropriate plugs.

What you *do* get that isn't in the standard Master is an edge connector carrying useful lines from all over the machine, a digital joystick/mouse port, View and

Logo. The last two are supplied on disk rather than in ROMs. Once loaded into sideways RAM, they're just as accessible as the ROM-based versions we've been used to. The battery-backed RAM is still there to save your configuration status.

Whether the Compact's separate keyboard is a blessing or a nuisance is very much a personal preference: I love separate keyboards, but I hate the leads. Not one to be easily satisfied, I also detest cordless keyboards, because whenever you squirm into a comfortable position you inevitably lose communication between the keyboard and the main box. The Compact — perhaps due to someone's feelings of insecurity — has three leads, and is therefore thrice damned. However, my dislike of the physical arrangement was immediately dispelled when I began using the keys: they're an absolute delight. Not only are they lighter to use than the Master's, they're quieter.

Choice of Drives

In the UK you can have a Compact fitted with any sized disk system you like, as long as it's 9 cm; but it looks as if 13 cm drives will be offered in addition to 9 cm models in Australia. With all BBC software currently on 13 cm disks, this certainly makes sense, even though most major educational software publishers (such as 4Mation, ESM, and Jacaranda) will be publishing on 9 cm disks.

The 9 cm drives are superb. Having

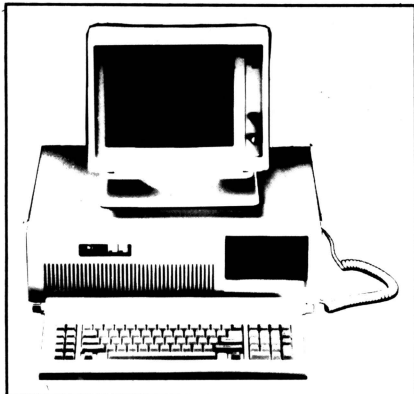
spent a fair bit of time flogging an IBM IX into life of late, I was almost convinced all 9 cm drives are noisy and slow and should be designated official disaster areas. It's a real pleasure to use the Compact's disk system: not only does it clip 25 percent off the time taken by a 13 cm DFS system to transfer data to and from disk, it is also very quiet. A typical *SAVE time for a 60 Kbyte file was 5.9 seconds, or about half the time taken by an IBM IX — and the furniture didn't even rattle. I would strongly recommend purchasing twin drives, if only to save your sanity when backing up disks. The *BACKUP facility requires 38 disk swaps to copy a disk — there must be a better way!

The Compact comes with one disk of demonstration software (nice to look at on a colour monitor, but pretty useless) and a great disk containing applications, utilities and entertainments. There's a Mac-lookalike desktop for those who enjoy using a \$1330 computer to imitate a \$13.30 calculator or a \$1.33 wristwatch. There's also a painting utility that is a pain to use because of its dependence on cursor keys. The kids switched to Aqua Attack after two frustrating minutes. Wreaking havoc on the seabed was entertaining for about a quarter of an hour, but it was Logo that took over for the rest of the weekend.

Likes and dislikes? The disk system and keyboard are definitely likeable, as is the inclusion of View 3.0 and Logo. My chief dislike in any machine is incompatibility with its ancestors. As far as software is concerned, this is not a problem with the Compact. But frustration is around the corner for anyone running the new beside the old, as nearly all connectors are different: only the RS232 and RGB connectors are the same.

At a price of around \$1330 plus tax, including a disk drive, it is certainly good value for people needing the most useful features and all the compatibility of the Master, without the frills. □

The ONE OF AUSTRALIA'S FASTEST AT'S AT PROFESSIONAL



We've built the VT AT for long distance, high speed computing with a 10MHz CPU as standard and, with optional 12.5MHz already built in, there's plenty of room left to move ahead. A VT computer will expand with you — its designed that way. Built from the world's top components; we offer 24 months "warranty as standard..." With Olivetti backed service Australia wide. The specs say it all: 1M RAM, 40 Mbyte 28m sec hard disk. Gate Array technology, Zero Wait State, built in networking capability, 4 I/O ports — all at a very competitive price.

From 1 to 100 fully compatible PC's, XT's or AT's, we can supply ex stock, from a total of 7 models because we don't just sell computers, we build them — in Australia.

Available next month:

Low cost VT-AT workstations for UNIX ZENIX, NOVELL & other networks.

 **VIDEO TECHNOLOGY**

17-19 Herbert Street, Dulwich Hill.

**"Professional computers
for the professionals"**

Ph: (02) 569 3700. Fax: (02) 550 0227.

LOTTO NUMBERS

**Data Base Support,
GPO Box 5266BB,
Melbourne 3001,
Phone (03) 267 3899.**

Here on disc is the raw data your computer needs to find you those winning numbers.

All numbers from all draws checked and guaranteed AT \$25 it is cheaper than keying it in yourself.

Phone in credit card orders accepted.

ALMOST ALL MAKES AND MODELS OF MICROS SUPPORTED

Please send mecopies of LOTTO NUMBERS at \$25 each.

NAME.....
Street.....
City.....Post code.....
BRAND OF COMPUTER.....
Model.....Operating system.....
Bankcard.....Mastercard.....VISA.....
No.....

SHATTER BARRIERS

■ Notice to all Turbo Pascal™ users

Write comprehensive programs better, with increased efficiency and higher performance features, by Turbo-charging your Turbo Pascal™ programs with three unbeatable products. Turbopower Utilities™, Turbo Extender™ and Turbo Professional™ will lift your programs to barrier breaking speeds. Turbopower Utilities, \$206*. Turbo Extender and Turbo Professional each \$222* (*incl. Sales Tax). Each is supplied with fully commented source code and a quality printed manual. Complete the coupon below or ring now on (03)5554544 with VISA, M/C or B/C orders. Please send: ☐ Turbo Power Utilities ☐ Turbo Extender ☐ Turbo Professional ☐ Literature. Cheque/Card No. enclosed.

Card No.: _____ Expiry Date: _____

Name: _____

Address: _____ P. C. _____

Phone: _____ Signature: _____



MICROWAY

A DIVISION OF EXCEL COMPUTERS
292 CHESTERVILLE ROAD, MOORABBIN, VIC. 3189

* For IBM PC/XT/AT and compatibles, with 256K and PC/MS DOS 2.0 or 3.0, and Turbo Pascal 3.0 • Trade Marks owned by Respective Companies

MM10451

768 KB
MADE IN USA 12 MONTH WARRANTY

BELOW COST CLEARANCE SALE!
15 ONLY 4.77 MHz KAYPRO PC'S
from \$1595.00**

DISCWARE introduces non-obsolescence THE KAYPRO PC

NEXT YEAR'S TECHNOLOGY?

That's easy. Replace the existing IBM PC/XT board with an IBM PC AT-compatible board, available now; IBM 32-bit standard, available soon; or whatever the future holds.

MEMORY-HUNGRY SOFTWARE?

The Discware Kaypro comes standard with 768 KB — and if that's not enough plug in an Above Memory board of your choice.

HIGH-RESOLUTION GRAPHICS?

KAYPRO's standard multivideo board features perfect monochrome clarity plus high-resolution colour (IBM CGA). But, if it's IBM EGA that you want? — simply snap in a board.

FURTHER SYSTEM EXPANSION?

But of course! The KAYPRO PC is ready for anything. With six available slots, add what you need — networking, modems, more memory — the sky's the limit.

MONITOR

A large range of monochrome and colour monitors available.

NOVELL ADVANCED NETWORK

Network your Kaypros with Novell Advanced Network/O. Let us design a network application for your business needs.

PLENTY OF STANDARD FEATURES?

POWER SUPPLY:

A generous 132 watts of power for even the most demanding hard drive.

FLOPPY DISK DRIVES:

Dual IBM-compatible floppy disk drives standard or slide in the drive of your choice.

HARD DRIVE EXPANSION:

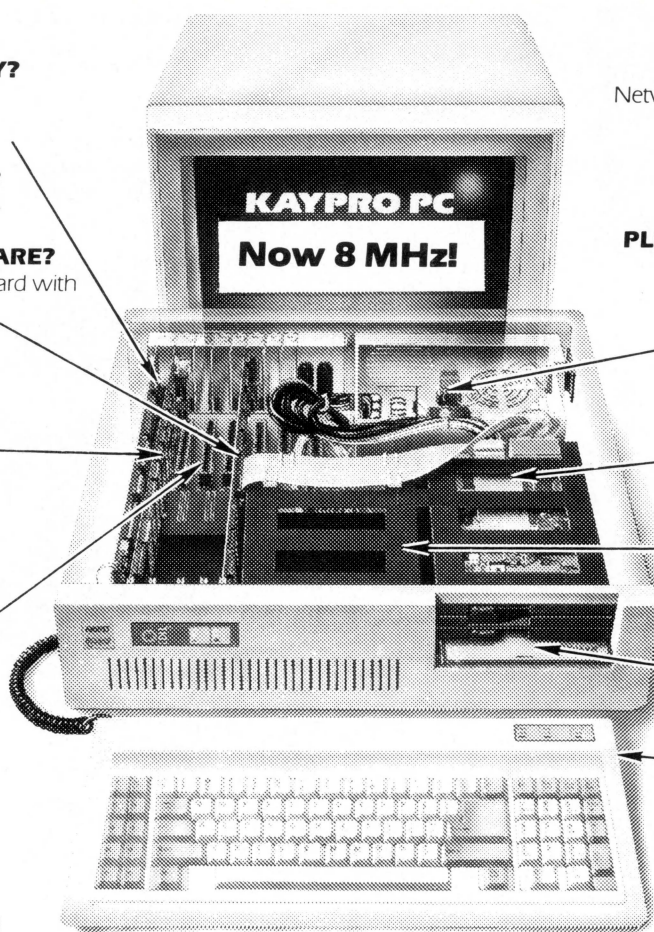
Space provided for easy additions of internal hard drives.

BUNDLED SOFTWARE:

A full selection of business software for today and tomorrow.

KEYBOARD:

Detachable, IBM PC AT-style keyboard with security keylock.



The Discware Guarantee

Not only does the Kaypro PC carry 12 month warranty, but, Discware offers an unprecedented support plan.

Should your Kaypro PC malfunction during the warranty period we will either replace or repair the faulty computer on the spot. And we provide hot line support free of charge.

*Discware support plan applies only to computers purchased from Discware. Full details available at our offices.

**Single floppy disk model.



5th Floor, 3 Smail Street, Broadway NSW 2007 Tel: (02) 212 6933

DISCWARE

the biggest range of PC products AT THE BEST PRICES

Olivetti M24 Hard Disk \$5490

640KB RAM, 20MB internal hard disk,
360KB floppy disk drive, parallel and serial
ports, hi-res green or amber monitor,
6 month warranty.

SUPER CALC 4 \$599

The Lotus eater, bigger and faster, reads
123 files, introductory offer.

HERCULES RAM FONT \$499

The New HERCULES MONO GRAPHIC
Board with Ram Font.

KAYPRO 286i \$4,700

The AT-compatible Kaypro. 80286 @
8MHz, 640KB, 1.2 MB floppy.

Toshiba T3100 \$call

The AT-compatible lap top.

EGA Monitor & Card \$1,425

SUPER SPECIALS FOR THIS MONTH ONLY

Seagate 20 MB	\$949.00
Le Modem	\$385.00
Seagate 30 MB	\$1190.00

Drafix 1. \$695

**The first high performance CAD
software everyone can afford.**

Low-cost, high performance computer-
aided design & drafting (CAD) software is
finally available for use on your PC.
There's never been a professional CAD
package so complete at such a low cost.

Olivetti M24 SP \$Call

8086 @ 10MHz, 640KB, 20 MB, limited
stock.

The SBT Database Accounting Library in dBASE III.

Free source code in every box.

dProfessional	
Time & Billing	\$695
dOrder	
Sales Order Processing	\$395
dInvoice/dStatement	
Accounts Receivable/Inventory	\$595
Control	
dPurchase	
Purchase Order	\$395
dPayable	
Accounts Payable	\$595
dLedger	
General Ledger/Finance	\$695
dAssets	
Asset/Depreciation	\$595
dProject	
Project/Job Accounting	\$695
dBackup	
Menu/Backup	\$99
Multi-user version available	

IBM SOFTWARE

	R.R.P.	Our Price
Borland's Superkey	169.00	119.00
Clipper Compiler dB III	1349.00	899.00
Copywrite	125.00	85.00
Crosstalk XVI	315.00	199.00
dBase III plus	1470.00	945.00
Fastback	299.00	250.00
Framework 2	1395.00	1050.00
Graftalk 4.08	1350.00	1199.00
Harvard Total Project Manager	1049.00	699.00
Harvard Presentation Graphics	849.00	569.00
Lattice 'C'	995.00	875.00
Lotus 123 rel. 2.01	1099.00	650.00
Microsoft Word V.3.0	999.00	745.00
Microsoft Word V.3.0 Mouse	1299.00	945.00
Mirror	145.00	109.00
MultiMate 3.3	1199.00	745.00
Norton Utilities 3.1	175.00	149.00
Open Access V.2.0	1299.00	899.00
Paradox	1470.00	959.00
PC Alien	105.00	99.00
Reflex 1.1	298.00	229.00
Symphony 1.2	1470.00	959.00
Side Kick ver. 1.5	109.00	85.00
TK! Solver 1.6	599.00	499.00
Timeline ver. 2.0	890.00	670.00
Turbo Lightning	225.00	149.00
Turbo Pascal, 8087, BDC	fr 125.00	fr 85.00

IBM SOFTWARE

	R.R.P.	Our Price
Turbo Prologue	200.00	149.00
TypeQuick	87.00	84.00
Word Perfect 4.1	879.00	659.00
Wordstar	599.00	350.00
Wordstar 2000 + rel. 2.0	950.00	599.00
Wordstar Professional	849.00	485.00
Products not listed: call for best price	call	call

MODEMS

NetComm 3+12 modem	\$219.00
NetComm Smart 123A	\$1050.00
NetComm Smart 1234	\$1290.00
NetComm Smart 2123	\$539.00
NetComm In/Modem	\$385.00
NetComm In/Modem 1234	\$1190.00
NetComm In/Modem 123	\$790.00
NetComm Smart 2400	\$899.00
NetComm Smart 1200	\$629.00
NetComm Trailblazer	\$Call

IBM HARDWARE

SAM Computer Phone Answering	\$660.00
VoiceCommand	\$1290.00
Cipher 25MB tape	\$1890.00
20 MB Drive Card	\$1450.00
Intel Above Board with free 8087 ..	\$599.00
Qubie 20MB hard disk	\$1050.00
Qubie 44MB hard disk	\$2600.00
Qubie 6 Pak 384KB	\$429.00
8087	\$259.00
Taxan Super Vision IV	\$1190.00
Sigma Color 400	\$990.00
Taxan Super Vision III	\$839.00
Qubie color monitor	\$699.00
Irwin 10MB tape internal	\$1150.00
Irwin 10MB tape external	\$1590.00
AST 6Pak with Sidekick	\$379.00
Microsoft Mouse	\$295.00
Tandon 20MB hard disk	\$1049.00
Toshiba P351 Printer	\$Call
NEC P5 Pinwriter	\$1800.00
NEC P6	\$880.00
NEC P7	\$1190.00
NEC ELF Spinwriter	\$799.00
Brother M1509	\$829.00
Epson LQ1000	\$1490.00



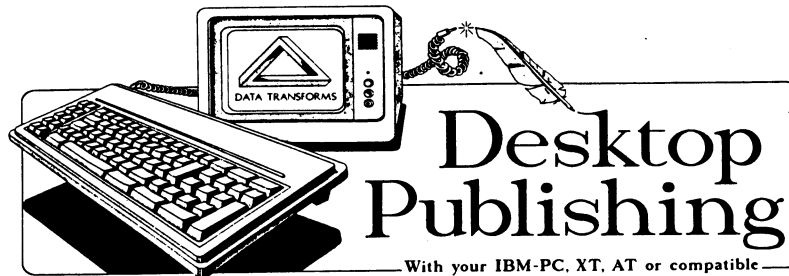
Prices apply to stocks held as at 20/10/86.
Availability may be limited at prices advertised.

**Call for specials and sales-tax exempted prices: (02) 212-6933, Call in, order by phone, or
send cheque or money order to: DISCWARE, 5th floor, 3 Small Street, BROADWAY NSW
2007 TLX: AA23509. For all products not listed call (02) 212-6933. Viatel * 778 000#**

FONTASTIC Results from our New Packages.

TCF COMPUTER SYSTEMS PTY LTD

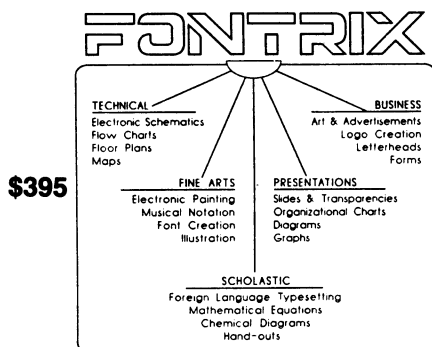
214 HARBORD ROAD BROOKVALE (02) 938-2522



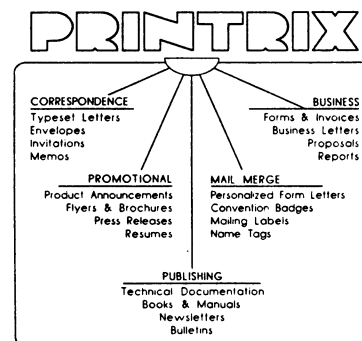
With your IBM-PC, XT, AT or compatible

FONTRIX is a screen based, visual editor of text and pictures. Its fonts and graphics are displayed on-screen exactly as they will appear in print. Perfectly suited for complex page layouts and technical drawings, **FONTRIX** gives you a high resolution "electronic page", a workspace up to 115 times the size of a single screen. The wealth of drawing and painting tools, enormous work area, electronic cut-and-paste, font editor, mouse interface and other fine features

PRINTRIX is an automated batch processor of textfiles. As such, it accepts both standard ASCII and native textfiles from most major word processors, adding fonts, page formatting and graphic insertions to print camera-ready output on your printer. A great range of features, like proportionally spaced fonts, variable form size, even automatic mail merge let **PRINTRIX** typeset everything from mailing labels to thousand-page documents.



\$395



\$325

TCF GENERAL ACCOUNTING \$ 795.
This package was built to Australian Accountancy Standards, to be used by Accountants or Business People to maintain a full set of books. Full reporting including Corporate Affairs, Directors, and all Audit Trails.

BASIC MANAGEMENT SYSTEMS ... \$ 1495.
Fully Integrated Open Item Accounting System, Debtors, Creditors, General Ledger, Stock Control with Backorder system, Alpha sort, Central Billing, Sales Areas, Commissions and many other reports. (Australian Package).

BUSINESS MANAGER \$ 625.
Standard Integrated Business Package, Debtors, Creditors, General Ledger, Stock Control, thousands sold. (Australian Package).

ESSENTIAL GRAPHICS for C ... \$ 475.
Over 150 Graphic Functions plus range of Text Fonts, Available in Libraries for Lattice, Microsoft, DeSmet, Astec & Computer Innovations C Compilers, Supports IBM CGA, Hercules, & EGA. Compatible with Fantasy & Fontrix.

C UTILITY LIBRARY \$ 375.
By Essential Software, over 300 functions. Available in Libraries for Lattice, Microsoft, DeSmet, Aztec, and Computer Innovations Compilers. Includes Source Code, why re-invent the wheel?

INTRODUCING C \$ 325.
Interactive C language training system complete with C Interpreter, Full Screen Editor, and Full Colour Graphic capabilities for IBM XT, AT. The fastest easiest way to learn C. The reference section is designed as an inclusive aid for both beginner and experienced programmer.

DESMET C COMPILER \$ 320.
C Programmers Development System, Includes Assembler, Debugger & Link.

MABEL (shopstock) \$ 1150.
Stock Control with Bar Coding, to suit Retail Point of Sale or Warehousing, large Selection of reports, including Dockets Invoices, Sales Performance, Stock Movement, Prints Bar Labels.

TMAKER INTEGRATED \$ 650.
The only fully integrated software suite to run on CP/M, MSDOS, PCDOS, CP/M86, With transferable data path. Wordprocessing, Database Spreadsheet, Spelling Checker, Bar Graphs, List Processor, Mail Merge Proof Reader, Dictionary, Help Menus, Excellent manual (in English).

TMASTER \$ 775.
A new package from Tmaker, runs on PCDOS only, a very large single file capacities up to 525k, Conditional rules in the spreadsheet, full pull down menu driven. With all the features of Tmaker, one of the most powerful integrated packages in the world, now in Colour.

PERSONAL PUBLISHER \$ 395.
Also from Tmaker, the company that produced the desktop publishing modules for the McIntosh. Allows mouse or keyboard control, Page Graphics and Publishing, Multi Column, Cut and Paste, Picture Wrap, Large Font Range, Laser Version available, Additional Image packs available, handles Imports.

PCNX \$ 198.
PC Operating System that gives you a UNIX environment. Includes popular Bourne shell, Multiuser, Multitasking, 100% compatible with MSDOS file systems, use existing MSDOS compilers, editors & linkers. Uses less than 512k, source code included. suit IBM PC, XT, AT and full compatibles.

OPERATING SYSTEM TOOLBOX ... \$ 198.
PC Operating System Construction Set, you can build your own Multitasking Multiuser Op/System. Port Mainframe system to PC's, 100% compatible with MSDOS file system, Source code supplied. suit IBM PC, XT, AT and Compat.

Queensland Distributor: Gumtree Computers Pty Ltd
14a Brisbane St. Ipswich (07) 202-3866

ONE OF THE little-known aspects of DOS is the Environment. DOS consists of three files: in the PC-DOS variant they are IBMBIO.COM, IBMDOS.COM and COMMAND.COM, while the MS-DOS equivalents are TBIOS.SYS, TDOS.SYS and COMMAND.COM.

Loosely speaking, the guts of PC-DOS and MS-DOS are in IBMBIO.COM and IBMDOS.COM, or TBIOS.SYS and TDOS.SYS. COMMAND.COM is the command processor which, among other things, accepts the commands typed at the prompt and processes them for action by the lower levels of DOS.

COMMAND.COM needs an area in which it can 'remember' things. Have you used the PATH command to set a path for DOS to search and find the programs you want to run? Is your screen prompt customised with the PROMPT command? In both these cases, DOS inserts a string into the environment to indicate the current setup. Want to inspect the contents of your environment area? Just enter the command SET with no parameters, and the contents of the environment will be displayed.

Setting the Environment

Additional strings can be inserted or modified by the user with the SET command, and programs can also insert, modify or remove environment strings. The environment expands as required, as long as no resident programs (like Sidekick) have been installed. With resident programs, the environment can't expand beyond 127 bytes, although if the environment is already larger than this *before* you load your program, that's okay.

Take a look at your environment now. Type the command SET, and at least two lines will appear on screen.

```
A: >set
```

```
PATH=
```

```
COMSPEC=A: COMMAND.COM
```

Even if the user has not set a path, DOS needs to be aware of this, and so the first line tells DOS no path has been set.

That second line? COMMAND.COM has two components. One of these, called the transient portion, is overwritten by application programs which need a little extra memory. It must be reloaded from disk when the application program terminates and the command processor is again re-

quired. Now you know the reason for the command 'Insert COMMAND.COM disk in drive A: and press any key when ready' which often appears on a floppy system.

Having to insert a boot disk into the A drive is a real pest for users of hard disks, who would prefer to be able to reload a copy of COMMAND.COM from the hard disk. The COMSPEC= string tells DOS in which drive and directory COMMAND.COM can be found and from which it can be reloaded. It can be changed with a command like SET COMSPEC = C: DOS, though with some 2.x versions of DOS this is not always successful.

Let's change the environment a little. Enter a path yourself, like this one:

```
A: >PATH C: UTILITY;C: NORTON;C: DOS
```

From a batch file or from the command line enter a variable name and a value for that variable:

```
A: >SET REFLEX = HERC
```

In this case, when the program REFLEX is used with a Hercules board, it looks into the environment for a variable called REFLEX. If it has the value HERC, then the video is aimed to the Hercules board rather than the more common Colour Graphics Adaptor. Now we're in the swing of things, add another two lines:

```
A: >SET ANSWER=xxxxxxxxxxxx
```

```
A: >PROMPT $p$g
```

Entering the SET command now without any parameters shows the new contents of the Environment:

```
A: >SET
```

```
COMSPEC=A: COMMAND.COM
```

```
PATH=C: UTILITY;C: NORTON;C: DOS
```

```
REFLEX = herc
```

```
ANSWER = xxxxxxxxxxxxxx
```

```
PROMPT=$p$g
```

Why that line starting with ANSWER? In the past I have mentioned the use of ASK.COM and SETERROR.COM to allow a batch file to give a message to the user and accept input from the user. They set the ERRORLEVEL accordingly, which allows a later command in the batch file to take variable action dependent upon the user input.

The only problem is user input is limited to one character. A longer string, such as a filename, can't be input. What if you could insert a string into the environment at boot-up, use a utility program to pass a message to the user, accept input and modify that environment string? Then a

later line in the batch file can retrieve the modified string and act upon it.

A neat little program called INQUIRE.COM, crafted in assembler by Mark Irving, of Drummoyne NSW, will do just that. I've put a copy of the program on the Your Computer Bulletin Board on (02) 953-8074. It is invoked with the line in a batch file:

```
INQUIRE message
```

This displays the message, accepts up to 12 characters of user input, and modifies the ANSWER = xxxxxxxxxxxx line previously inserted in the environment to ANSWER = message. The contents of an environment variable can be retrieved in a batch file with the syntax %VARIABLE%.

An example might clear up the fog I'm sure is developing. Make a batch file called TEST.BAT, containing the following commands:

```
echo off
```

```
set answer=xxxxxxxxxxxx
```

```
INQUIRE Show directory of what file-  
name/type?
```

```
dir %answer%
```

```
echo on
```

INQUIRE.COM must be in the default directory, or be able to be found through the current path.

Run this batch file. When prompted, enter the specification of the files you want listed, such as F*.*. INQUIRE reads your response, and replaces the xxx... in the environment with it. The fourth line of the batch file reads out your response from the environment and acts upon it.

Unfortunately, space precludes me from showing complex applications. Any samples must be cut to the bone, and the briefest of pointers to possible uses of the topic in hand are the most that will fit. In my July *Your IBM* column, I showed how to use Turbo Pascal to write filters which could be piped through DOS. The filters themselves were not important and the application (printing a Wordstar file) was even less so. What *was* essential was the discussion of compiler directives and buffer sizes. The application was selected on the basis most users would have a Wordstar file available to test the examples, not that it was a desirable way of printing Wordstar! Here, the four-line sample batch file could be expanded into line after line of devious code, and I am sure many of you will do just that. □

Icebergs Ahoy!

I SUPPOSE change is inevitable in all aspects of life — but I sometimes wish the computer companies would slow down their race a little and give us all a rest for a while.

It's the new system software for the Mac which has brought on this rash of conservatism — I normally welcome each new software release with a cry of joy, but this is about the thirty-third time I've had to update all my software with a new system and it's no longer fun.

I've spent a laborious couple of days installing Finder 5.3 and System 3.2, which are the latest — but the rumour mills are already churning out that System 3.3 is on the way.

Apple has gone through three versions of Finder in as many months, and despite the fact that the Mac Plus has only just appeared in reasonable numbers, there are already two (or more) versions of the new 128 Kbyte ROMs circulating in Australia.

I suppose we've got to expect problems associated with substantial changes such as the recent swap from the old MFS (Macintosh File System) to the new HFS (Hierarchical File System). HFS was definitely needed to handle the new 800 Kbyte floppies and Apple's 20 Mbyte hard disk (HD20).

Unfortunately, the price we pay for keeping the Mac user-friendly is in having extremely complex systems software. Whenever substantial changes are made, we must expect a period of bugs, malfunctions and crashes. It's a fact of life; we don't have to like it, but I guess we must learn to live with it for a while.

There's no doubt Apple is having trouble finding the bugs in HFS; the company wouldn't constantly be changing its System or Finder if it wasn't. On the ROM front, Apple says the difference between Version 1 and 3 (Version 2 didn't ever make it here!) is a "patch for the SCSI port", but there's probably more to it than that.

The problem is compounded by the fact that an increasing number of users now have access to Laserwriters, the Hard Disk 20 and Appletalk networks. Unfortunately, the combined complexity of hardware, ROMs, system, utilities and applications software has almost reached critical mass. A user-explosion is imminent unless everything is allowed to cool down a bit.

If you are a new or old Mac user buying new software, you must be prepared to check for incompatibility and instability for some time to come. Deal only with a retailer who will promise to replace, exchange or refund on software that doesn't work up to expectations.

We are at the stage where the difference between System version 3.1 and version 3.2 might be inconsequential for some users, and soul-destroying for others. It's become the luck of the draw — "What works with what?" — and there's very little being published to guide us.

**If It Works —
Don't Change It**

Unless you've got a real need for the HFS file system, it is probably best to stay with the combination of the Finder 4.1 and System 2.0. This is what both Apple and commonsense suggest, although some people are said to be using the HFS system on old Fat Macs without any problems, even though they lack part of the necessary code which is only found in the new ROMs.

If you intend adding new systems to your disks, remember every higher version of Finder has an increased requirement for disk and memory space, and you might have trouble fitting some of these on to old disks or using them with Switcher.

There's also a difference in the way the new Finders organise files on disk, and since the System and Finder are on the outermost disk tracks (where most problems occur), you are especially likely to get problems if your disks are old. Remember also that the HFS file system needs shorter filenames, so you might have to rename.

Getting the Pips

Software developers are complaining bitterly that Apple still hasn't given them full details of how HFS operates — but even if they did know, and understand, there are probably so many permutations and combinations at present that new software would run into trouble, anyway.

What we seem to be facing with the Macintosh is a problem similar to that faced by IBM software developers for a number of years. Remember the '96 per cent compatible' ads? (On average, only 4 per cent of the code was fatal!) At the same time every clone-maker tried to get around the BIOS problems in its own way.

But while IBM could blame the clone-makers, Apple has no one else to finger but itself — although the company rightly points out that many software developers haven't strictly followed the guidelines. The software companies, on the other hand, maintain the guidelines are inadequate, incorrect or impossible.

If you are a new or old Mac user buying new software, you must be prepared to check for incompatibility and instability for some time to come. Deal only with a retailer who will promise to replace, exchange or refund on software that doesn't work up to expectations.

Hayden has admitted that Musicworks crashes with HFS because the company didn't adhere to Apple's recommendations (use Musicworks 1.0 on floppy only). But MacPaint gives problems too; it must reside on a system disk for the clipboard functions to operate correctly.

Microsoft's Word and File also crash with HFS, as do the old versions of MacTerminal, MacWrite, Sidekick's Notepad+Click-On Worksheet, and Font/DA mover. New versions are on the way.

Switcher 4.4 adds about 20 Kbytes to each of the applications you are using, and all must be in the same folder; Excel also requires that all linked documents must be in the same folder; and a number of other popular applications (such as Dollars and Sense, and Filevision) will only work from 400 Kbyte floppies. Think Tank 1.1 can't access folders and is occasionally unstable, while 1.2 runs okay. And the new HFS version of Jazz still has some bugs.

As the Captain of the Titanic wrote in his morning report "Apart from a few icebergs, conditions are excellent!" □

NEC PRICE CRASH

Yes, these incredible prices all include sales tax and a free copy of "ENABLE Learn" with each complete system.

APC IV

- 40 Mb quick access hard disc
- 1.2 Mb floppy (reads 360K and 720K)
- Colour monitor and keyboard included

Colour Graphics: \$7,582

Advanced Graphics: \$7,974

(Note: The APC IV is totally 'AT' hardware/software compatible)

APC III

- 20 Mb NEC hard disc
- 1.2 Mb floppy (reads 360K and 720K)
- 384K RAM (add \$278 for 640K)

Monochrome: \$4,333

Colour: \$4,875

PRINTERS

- 24-pin letter quality
- 8K buffer
- 5000 hours between failures

P6 (80 col.):	\$808
Pin feed tractor:	\$73
Cut sheet feeder:	\$355

P7 (136 col.):	\$1,053
Pinfeed tractor:	\$109
Cut sheet feeder:	\$440

P5 parallel:	\$1,536
P5XL parallel, colour:	\$1,949
ELF daisy wheel:	\$653

P6 colour:	\$995
P7 colour:	\$1,259
3500 daisy wheel:	from \$1,762

NEC

N.S.W.: (02) 858-5999 VIC: (03) 690-9196
QLD: (07) 221-6198 S.A.: (08) 51-3947 W.A.: (09) 328 2972
MAIL ORDERS: 1039a Victoria Rd, West Ryde, 2114

A.T.S. COMPUTING

"Advanced Technology + Service"

SERVICES

LETTERS TO THE EDITOR

We are happy to receive your comments and, if they are of interest to other readers, publish them. Letters will only be considered for publication if they include your name and address, although we can withhold such details from publishing on request. Note that we reserve the right to (and probably will) edit all letters for the sake of brevity, clarity or accuracy.

SUBSCRIPTIONS

Standard 12-issue rate within Australia: \$35.40. Surface rate for New Zealand and Papua New Guinea: \$51.80; airmail rate: \$57. Rates for other countries on application. All overseas rates quoted are to be paid in Australian dollars. Allow up to eight weeks for subscription processing.

BACK COPIES

Back copies of *Your Computer* are available from The Federal Publishing Co, PO Box 227, Waterloo 2017 at A\$4.00 each, including postage for Australia and New Zealand. We will supply photostat copies of articles where a back issue is not available, at the single-magazine price for each feature copied.

READERS' ENQUIRIES

We will make every effort to answer readers' written enquiries, if accompanied by a stamped, self-addressed envelope, although staff shortages and deadline pressures may cause delays. Please include your telephone number(s) with any enquiry. Phone enquiries not related to subscriptions, readers' advertisements, or other 'service information' cannot be accepted.

COPYRIGHT

All material appearing in *Your Computer* magazine is copyright and cannot be reproduced in part or in full, by any means, without the written permission of the Publisher or Managing Editor. Computer clubs and schools can, however, apply for restricted

permanent reproduction rights for non-commercial, limited-circulation use (for example, newsletters and class instruction). Given that it sometimes takes us a while to answer such requests, you can consider that restricted permanent rights apply in these cases from the day you send in your letter, and will later be confirmed (or withdrawn) by our reply.

LIABILITY

Although it is policy to check all material used in *Your Computer* for accuracy, usefulness and suitability, no warranty, either expressed or implied, is offered for any losses due to the use of any material in this magazine.

EDITORIAL CONTRIBUTIONS

Contributions to *Your Computer* are welcomed and will be given every consideration. Although the greatest care will be exercised with contributions, no responsibility can be accepted for the safety or return of any letters, manuscripts, photographs or other materials supplied to *Your Computer* magazine. If return is desired, you should include a stamped, self-addressed envelope. If return is critical — say it's something you can't afford to lose — then don't send it; we are careful, but we're not perfect. Please read these notes carefully to get an idea of the style and format we prefer.

All Contributions: should include your name, address, and home and office phone numbers (in case we need to check details). Each page of your submission, and any material sent with it, should also carry your name.

Contributions by Telephone: Contributors who have modems and suitable software (in the MODEM7/YAM mould — see our stories on Christensen Protocols in the May and June 1983 issues) can arrange direct transfer to our computers through our Bulletin Board system, which is on-line 24 hours a day, seven days a week. Contact our office by

phone for details on transferring material in this way.

Contributions on Disk: Contributions can be accepted in most disk formats, although some have to be converted outside our offices, which will add to the (often lengthy) delay between receipt and acknowledgement. The preferred medium is IBM standard format single-sided, single-density, 20 cm CP/M disks or IBM PC-DOS minifloppies. We can also handle, in-office, most soft-sectored 13 cm disks, thanks to PC-Alien — so unless you have a particularly strange format, send it on disk straight from your machine. Please pack them extremely carefully if posting and label all disks with your name, address and phone number.

Listings: Unless it is absolutely impossible, we want listings produced on the computer. This reduces the risk of error — if the computer typed it, the computer probably accepted it. Print listings with a dark — preferably new — ribbon on white paper, and try to format the output to a narrow (40 characters) width. If they can't be produced on a printer, borrow a good typewriter — hand-written material is likely to sit around the office for a year before someone can find time to type it all out for you! Please provide an account of what the program does, how it works and so on. Any comments on the program should refer to the address, line number or label rather than to a page number. Any comments on modifying the program to work on other machines will be appreciated. Try to include a printout of at least part of a sample run if possible.

Style: All items should be typed (or printed) and double-spaced on plain white paper. We will only accept original copies — no photostats. Include your name, address, telephone number and the date on the first page of your manuscript (all manuscript pages should have your surname and page number in the top right-hand corner). Be clear and concise, and keep jargon and adjectives to a minimum. □

AD INDEX

ADE Computers	63
AID Systems	79
Amsnet International	89
Apple Australia	41, 42, 43
ATS Computing	111
Attache Software	59
Blue Sky Industries	65
Clarity Computers	27
Computer Haven	86, 87
Computer Print and Paper	65
Computemax	22
Creative Computing	82
Custom Made Software	103
Cypher Research	90
Data Base Support	105
Dick Smith Electronics	100
Discware	106, 107
Earth Computer Systems	67
Electronic Solutions	93
Emona	79

Epson	114
Federal Merchandising	113
Hi-Tech Software	4
Interface Publications	25
Intouch Marketing	31, 33
Keller Automation	81, 91
Lasernet Computing Systems	12
Logo Computers	31
McLaggan Wright & Assoc	Ozi
Memorex	IFC
Micro Educational	51
Micro General	50
Micro-Land	94, 95
Microbee Systems	8, 55
Microway	105
Mobex	96, 97
Nashua	11
Netcomm	OBC, 44
Osborne Australia	76
Ozisoft	72

Perfect Information	57
President Computers	14
Pursuit Computer Systems	13, 26
Reader's Classifieds	113
Ritronics	23
Select Software	6, 7
Services	112
Software Express	49
Solid Support Software	26
Stemsoft	102
Stylus	52
Subscriptions	74, 75
Telecorp	10
The Computer Factory	108
TTI Computers	90
Utilico	16
Verbatim	36
Video Technology	13, 105
Vizden	17
W.D. & H.O. Wills	73

FREE READERS' CLASSIFIEDS

Apple Software

ProDos startup for Ile, Ilc. Includes file utilities, time/date set, file selection with a single key-press! Send \$10 plus formatted disk, or SSAE for details to: David Turnedge, 31 Kaluga Street, Busby 2168.

Printer Buffer Kit

My \$39, 8 Kbyte to 256 Kbyte Centronics Parallel Printer Buffer Kit now has an optional plug-in 75 to 19,200 baud serial converter board for \$18, and a printer-sharer board for \$12. For more info send SAE to Don McKenzie, 29 Ellesmere Crescent, Tullamarine 3043.

Tandy/TRS-80 printer

Model I, III, 4 and Colour Computer printer, as new, never used, DMP-105: \$450 ono. David Minehan, (049) 52 2908.

Tandy/TRS-80

Model I 48K Microcomputer 16 Kbyte keyboard, 32 Kbyte expansion interface, phosphor green-screen monitor, datasette, single 35-track disk drive, DOS 2.3, 2.3b with software (Scripsit 1.0, in-Memory information 2.0, Budget Management, Model III

DOS 1.3 Manual, + games), no printer: \$1200 ono. David Minehan, (049) 52 2908.

Tandy System-80, TRS-80 Software

For list and prices, send a SSAE to: R. Gallimore, 6 Charlestown Road, New Lambton Heights, Newcastle 2305.

Sybiz Accounting Software

Sybiz Plus — Fully integrated General Ledger and Debtors programs. NEC-compatible. Cost \$800 each, sell \$400 each. Phone (075) 385 889.

Kaga Monitor

For Sale. \$350. High-resolution Kaga 12 inch colour monitor, Model Taxan Vision Ex. Suitable for any computer with 40-column text. Composite or separate RGB signal plus audio signal inputs. Will pay Comet freight within Australia. Contact R. English, PO Box 159, Cobar 2835; (068) 36 6433.

C64 Software

Original C64 software, all \$5 to \$10. Includes Spy Hunter, Gooch's Cricket, Tennis, Pipeline, Lightpen, APC magazines and

"MOPI"
it is a true

UNIVERSAL ASSEMBLER.

Able to generate machine code for virtually any 8,16 or 32 bit microprocessor. Comes with a 200 page manual.

For MS-DOS or CP/M. Specify format.

Further info/purchase:

PTIZAN Computer Services
Box 69, Belconnen. A.C.T. 2616 **\$175.00**
Phone (062) 586823

FREE CLASSIFIEDS are for readers only, not commercial organisations. The first 20 words are accepted free of charge with a charge of 20 cents for each additional word. Good quality black-and-white prints may be included for a charge of \$10 each. Multiple classifieds in one issue are treated and charged as singles.

COMMERCIAL ORGANISATIONS can place classifieds for a charge of 35 cents per word (minimum charge \$10). Black-and-white photographs may be included for a charge of \$20 each.

PRINT OR TYPE your ad clearly and legibly, double-spaced, and separately include your name, address and phone number for checking purposes, even if these are not to be included in the ad.

Any payment due must accompany the copy.

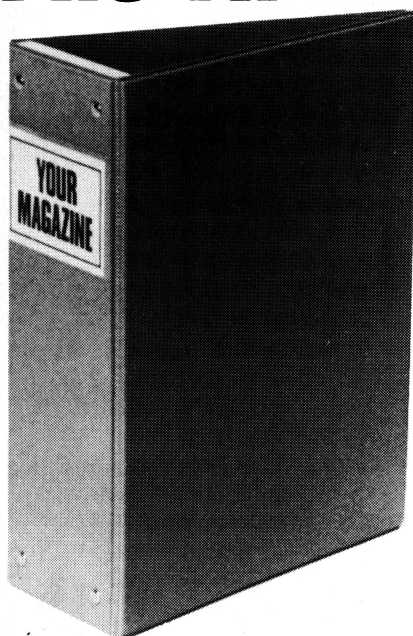
others. Phone (02) 634 4487.

Information Wanted

Anyone with details on RTTY

decoding with an Apple Ilc, please contact Mike Hickey at 9 Adderley Street, Mt Claremont 6010; 384 7312. ☐

Can't Find It? File It!



These attractive, ready to use, skyblue vinyl binders have been specially designed to hold and protect 12 of your valuable magazine collection in the easy clip-in fastener wires.

**THE IDEAL GIFT
FOR REGULAR
READERS!**

Please send me @ \$8.00 each = \$
PLUS postage & handling @ \$2.90 each = \$

For TOTAL

(Magazine Name)

() I enclose my cheque/money order (with this form in an envelope) for \$
(make cheques payable to: The Federal Publishing Co.)

() Charge my () Bankcard () Mastercard

() Amex () Visa with \$

Card No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Mail Post Free in Australia to: **Federal Direct**

Freepost No. 4 P.O. Box 227 Waterloo, N.S.W. 2017

Signature:
(Unsigned orders cannot be accepted)

Expiry / /

Name:
Mr/Mrs/Miss/Ms Initial Surname

Address:

..... Postcode

Date of Order: / / Telephone ()

"THE EPSON PC+ AN ADDED PLUS FOR YOUR BUSINESS."

James Dibble.



Now the Epson PC family has an added plus. It's called the PC+, a fully compatible personal computer for all those people whose business or profession demands a more powerful personal computer.

The Business Computer of the Year's big brother.

The PC+ has all the features that made Epson PC winner of Business Review Weekly's Business Computer of the Year award. The same legendary reliability. The famous Epson twelve month warranty. And the same amazingly compact size.

The technical pluses you're after.

The Epson PC+ also boasts the technical pluses its name implies. Like double the processing speed, a standard 640K RAM and five expansion slots making it ideal for networking.

There's a dual speed microprocessor, precision keyboard

and options including a 20Mbyte hard disk and a 1.2 Mbyte floppy disk drive.

Epson, your first choice.

Epson are number one in printers simply because they are hard to beat for features, reliability and value. And now in personal computers, the Epson PC+ can give your business the added plus you need. For your nearest Epson dealer, phone Sydney (02) 452 5222; Melbourne (03) 543 6455; Brisbane (07) 832 5400. Adelaide (08) 332 8501; or Perth (09) 322 1896.

EPSON®

EPS0080

\$275 SOFTWARE & 300/1200 MODEM PACKAGE FOR ALL PC/MS-DOS COMPUTERS!



Announcing the All-Australian
HYPEC ELECTRONICS 300/1200
MODEM Comms Package!

Never before such a Value-for-Money offer: Here's what you get for just \$275:

HYPEC 300/1200 BPS MODEM:

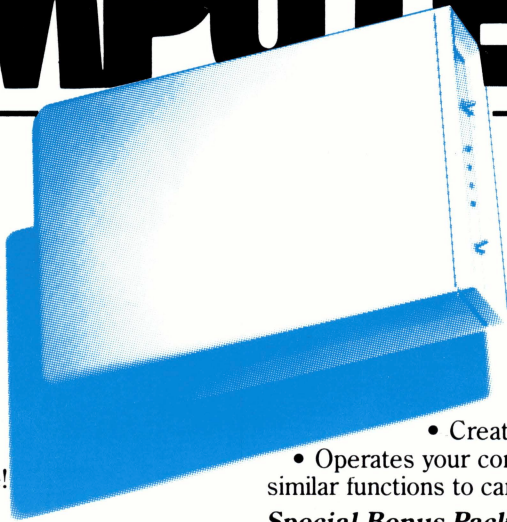
- Designed and manufactured in Australia to suit local communications standards.
 - Optional HYPEC AutoDialer Accessory available!
 - Suits any computer with RS232 Interface!
 - Connects to Viatel at 1200/75 BPS!
 - Dials up Bulletin Boards at 300 BPS Full Duplex!
 - Goes on-line to Databases and remote Mainframes!
- Telecom Approval pending.

PLUS

Australia's own feature-packed COMMUNICATIONS SOFTWARE PROGRAMME! **SuperCom II FREE OF COST!** Yes! Normally \$175—it's FREE with your HYPEC Modem Package!

SuperCom II, Australia's own highly-acclaimed Communications Software Programme:

- Provides full support for the Viatel Videotext system, in addition to all on-line databases and mainframe computers!



- Emulates all popular terminals!
- Automatic Log-on!
- Saves and replays frames, including Viatel!
- Sends and Receives to mainframes!
- Captures dial-up sessions to disk!
- Sets-up advanced dialling directories and batch command files!
- Uses Modem 7 & YAM batch transfer protocols!
- Creates & Edits custom terminal emulations!
- Operates your computer remotely in photostat mode, with similar functions to carbon copy*!

Special Bonus Package Offer! HYPEC Automatic Dial-Up Answer Unit just \$50 with every HYPEC Modem sold!

You just won't beat this fantastic offer on communications equipment anywhere else. So call us on the HYPEC Hotline, and BUY AUSTRALIAN-MADE! *Registered trade name.

HYPEC ELECTRONICS PTY LTD

21 Ryedale Rd, West Ryde, Sydney NSW Australia 2114.

Tel: (02) 808 3666. Fax: 808 3596. Cable: LAMRON

SYDNEY. Telex: AA71551 LAMRON.

TELEPHONE ORDER HOTLINE: (02) 808 3666.

Bank cheque, money order, Visa, Bankcard & MasterCard accepted.

HYPEC
ELECTRONICS

THE ADVERTISING AGENCY: HYPEC.7



NetComm's new DataLock modems. Guaranteed to get your data through.

Information is the life blood of your company, and the most valuable asset you have. Far too valuable, in fact, to be trusted to anything but the new DataLock modems from NetComm.

Covering everyday low-speed operations, and the super-fast requirements of today's business user, DataLock modems provide a security lock on your data with a password and dial-back facility, to keep unauthorised users out of your system.

Data is further protected by the use of a security protocol between modems.

Packetised data transmission enables DataLock modems to verify data and to retransmit lost or scrambled data without the need for special software. And this facility is totally user transparent.

DataLock modems feature constant and variable speed interfaces to support the full AT command set, including the new 2400, and can operate at 300, 1200/75, 1200 and 2400 baud, full duplex.

And they come bundled with NetComm's Videotext and Asynchronous Communications Software, plus Pop Up — the handiest desk diary and organiser software package you can get.

And, of course, they're conceived, designed and made in Australia.

So if you want the very latest modem technology, NetComm reliability, and secure, error-free data transmission, get your hands on the new DataLock modems. And keep unauthorised hands off your data.

© DataLock is a registered trademark of NetComm (Australia) Pty Ltd

NetComm

Total Solutions for Data Communications

NetComm (Aust) Pty Ltd • NSW PO Box 284 Pymble NSW 2073 Tel: (02) 888 5533 Telex: AA27488 MODEMS Minerva: 07:DNC002 Viatel: 288855330
VICTORIA 94 River Street South Yarra 3141 Tel: (03) 241 0534 **QUEENSLAND** Suite 6 Level 11 AMP Place 10 Eagle Street Brisbane 4000 Tel: (07) 229 7376

NE38FPC